NAVSHIPS 92746 (Non-Registered)

TECHNICAL MANUAL

for

ANTENNA COUPLER GROUP AN/SRA-13, AN/SRA-14, AN/SRA-15

NEMS-CLARKE, INC.
SILVER SPRING, MARYLAND

NEMS-CLARKE CO.
A Division of VITRO Corporation of America
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BUREAU OF SHIPS
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IN REPLY REFER TO
Code 993-100
26 April 1956

From: Chief, Bureau of Ships
To: All Activities Concerned with the Installation, Operation, and Maintenance of the Subject Equipment

Subj: Technical Manual for Antenna Coupler Group AN/SRA-13, AN/SRA-14, AN/SRA-15 NAVSHIPS 92746

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A. G. MUMMA
Chief of Bureau

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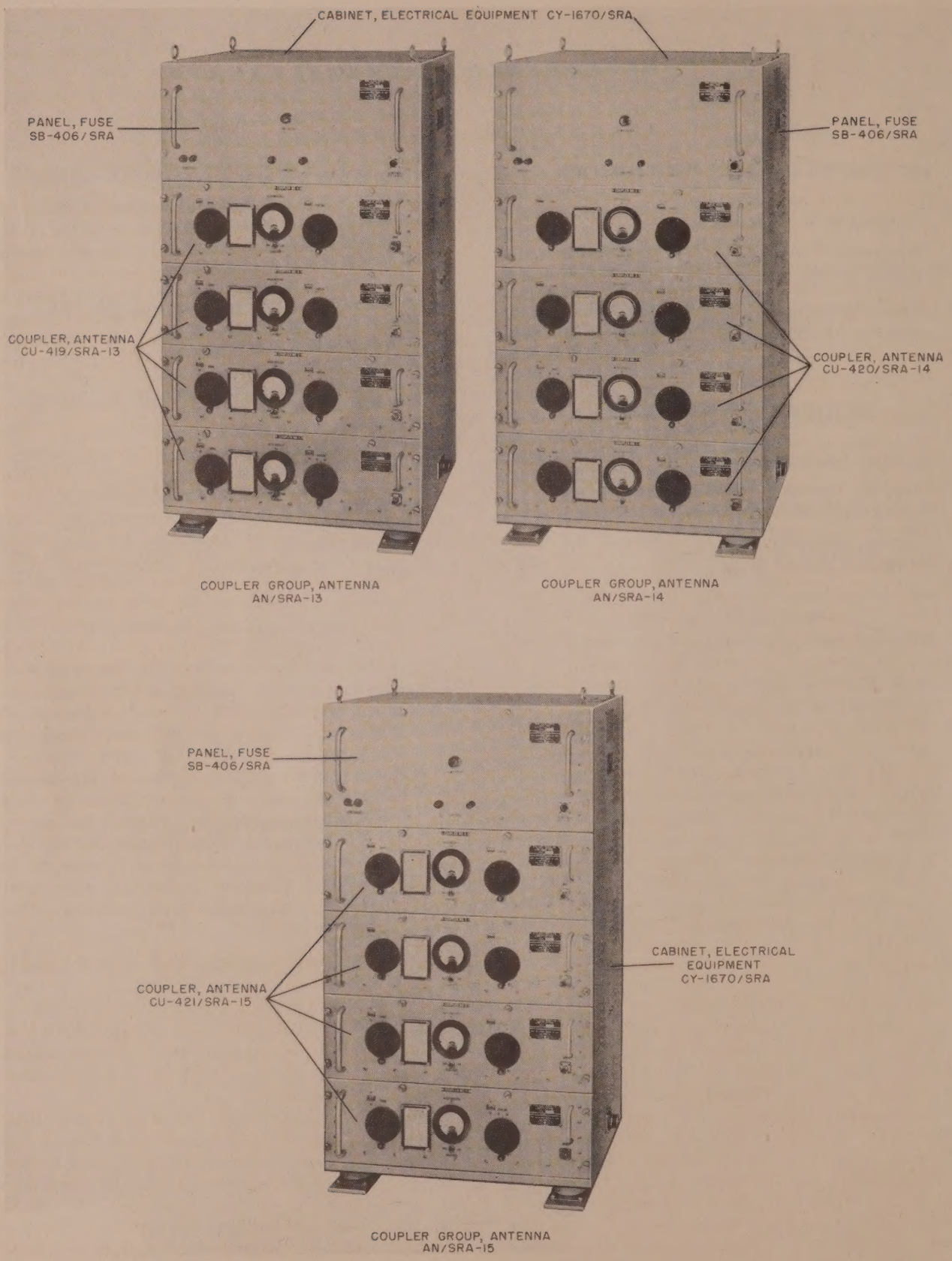


Figure 1-1. Coupler Group, Antenna AN/SRA-13; Coupler Group, Antenna AN/SRA-14; and Coupler Group, Antenna AN/SRA-15, Major Units

SECTION 1

GENERAL DESCRIPTION

1. INTRODUCTION.

This instruction book covers the description, theory, installation, operation, and maintenance of three different antenna multi-couplers designated as Coupler Group, Antenna AN/SRA-13; Coupler Group, Antenna AN/SRA-14; and Coupler Group, Antenna AN/SRA-15 (figure 1–1).

Also covered in this instruction book are the major units and their associated parts necessary for maintenance.

2. DIFFERENCE IN MODELS.

Coupler Groups, Antenna AN/SRA-13, AN/SRA-14, and AN/SRA-15 are similar to each other except that they operate in different frequency ranges as follows: Coupler Group, Antenna AN/SRA-13— 2–6 mc; AN/SRA-14— 4–12 mc; AN/SRA-15— 6–18 mc.

3. PURPOSE.

These Antenna Coupler Groups are designed for shipboard use. Each coupler group is capable of coupling four transmitters into a single broadband antenna. Each coupler group must be operated independently with a broadband antenna designed to produce a voltage standing wave ratio no greater than 3 to 1 over its frequency range at the output terminal of the coupler group. Each transmitter operating with a coupler group must be set to operate at channels spaced at least 10 per cent from any other frequency in the group. This spacing should be based upon the high-frequency end of the band. For example, in the AN/SRA-13 (2 to 6 mc) the spacing between channels should be 400 kc, making possible 10 channels in the 4 mc band. The principal function of these equipments is to provide an efficient means for operating, simultaneously, several transmitters, having output power up to 500 watts, into a single broadband antenna.

4. PRINCIPLES OF OPERATION.

The operation of the three Antenna Coupler Groups AN/SRA-13, 14 and 15 is essentially the same except for differences in electrical characteristics which require operation in the three frequency ranges indicated in paragraph 2 above.

There are four antenna couplers, designated COUPLER NO.1, COUPLER NO. 2, COUPLER NO. 3 and COUPLER NO. 4, in each coupler group. The coupling circuit of each of the four antenna couplers is connected in series along the inner conductor of a common coaxial transmission line to the antenna.

The antenna couplers match the impedance of the antenna transmission line to the impedance of the transmission lines between the transmitters and the antenna couplers. Operation of a coupler is based on the principle of transferring power at a specific operating frequency (which is the transmitter frequency) into the antenna system, and to prevent the flow of power into the antenna coupler at frequencies other than its operating frequency. Impedance matching is accomplished by means of tunable input and output coupling circuits and a tunable tank circuit.

Power from the transmitter passes through an input or feeder line, and into the input coupling circuit. When the input, the tank and the output circuits are properly tuned to the transmitter frequency, the antenna-line impedance matches the impedance of the r-f feeder line, and power from the transmitter is coupled into the antenna system. The current in any one antenna coupler does not affect the remaining three couplers of the group provided that the other couplers are tuned to frequencies such that the minimum spacing between operating channels is approximately 10 per cent.

A directional-coupler device, hereafter called Match Indicator, shows, by means of a microammeter the relative magnitude of r-f voltage being reflected back toward the transmitter from the antenna coupler when the system is not matched to the antenna transmission line.

A blower assembly provides forced ventilation to cool the four antenna couplers. The blower assembly is housed behind a fuse panel which contains two active and two spare fuses for protection of the blower assembly. This panel also contains a receptacle for connecting the blower assembly to a primary power source, and an indicator lamp which lights when the blower is in operation.

5. GENERAL DESCRIPTION AND LIST OF MAJOR UNITS

a. GENERAL DESCRIPTION.—Coupler Groups, Antenna AN/SRA-13, AN/SRA-14, and AN/SRA-15 are identical as to function and size, have approximately the same weight, 169½ to 176¾ pounds, but differ in electrical characteristics.

Coupler Group, Antenna AN/SRA-13, AN/SRA-14, and AN/SRA-15 are each composed of 6 major units (see figure 1–1 and Table 1–1). Each group utilizes a Cabinet, Electrical Equipment CY-1670/SRA and a Fuse Panel SB-406/SRA. Coupler Group AN/SRA-13 contains four Antenna Couplers CU-419/SRA-13 which are identical, and are designated as COUPLER NO. 1, COUPLER NO. 2, COUPLER NO. 3, and COUPLER NO. 4. They are located in the bottom four decks of

Cabinet, Electrical Equipment CY-1670/SRA with COUPLER NO. 1 located on the second deck from the top of the cabinet, COUPLER NO. 2 located on the third deck from the top of the cabinet, COUPLER NO. 3 located on the fourth deck from the top of the cabinet, and COUPLER NO. 4 located on the fifth deck from the top of the cabinet. Panel, Fuse SB-406/SRA is located on the first deck of the cabinet.

The four antenna couplers are built as drawer assemblies, of the plug-in type, so as to be readily removable from the front of the cabinet for maintenance purposes. Tuning is accomplished by means of two variable controls which may be locked to the exact frequency desired. Two mechanical counters are mechanically connected to the two variable controls to indicate the settings of the controls. A microammeter, which is part of the match indicator circuit, is mounted on the front panel to indicate optimum tuning.

Panel, Fuse SB-406/SRA is also built as a drawer assembly and connects the power source to the blower assembly and encloses the top deck of Cabinet, Electrical Equipment CY-1670/SRA.

b. LIST OF MAJOR UNITS.—Coupler Group, Antenna AN/SRA-13, Coupler Group, Antenna AN/SRA-14, and Coupler Group, Antenna AN/SRA-15 consist of the following major units.

(1) Coupler Group, Antenna AN/SRA-13 contains:
  (*a*) Four Coupler, Antenna CU-419/SRA-13 types.
  (*b*) Panel, Fuse SB-406/SRA.
  (*c*) Cabinet, Electrical Equipment CY-1670/SRA.

(2) Coupler Group, Antenna AN/SRA-14 contains:
  (*a*) Four Coupler, Antenna CU-420/SRA-14 types.
  (*b*) Panel, Fuse SB-406/SRA.
  (*c*) Cabinet, Electrical Equipment CY-1670/SRA.

(3) Coupler Group, Antenna AN/SRA-15 contains:
  (*a*) Four Coupler, Antenna CU-421/SRA-15 types.
  (*b*) Panel, Fuse SB-406/SRA.
  (*c*) Cabinet, Electrical Equipment CY-1670/SRA.

6. DETAILED DESCRIPTION OF MAJOR UNITS.

Detailed descriptions of the major units which comprise all three coupler groups are given in the following subparagraphs:

a. COUPLER, ANTENNA CU-419/SRA-13.—Coupler, Antenna CU-419/SRA-13 (see figure 1–2) is one of four identical antenna couplers used in Coupler Group, Antenna AN/SRA-13. It operates in the frequency range of 2—6 megacycles. The four antenna couplers, located in the last four decks of Cabinet, Electrical Equipment CY-1670/SRA, are arranged as individual drawer assemblies of the plug-in type, and are designated COUPLER NO. 1, COUPLER NO. 2, COUPLER NO. 3, and COUPLER NO. 4.

Figure 1-2. Coupler, Antenna CU-419/SRA-13, Front Oblique View

Each antenna coupler has two variable controls mounted on the front panel; each control is geared to a four-figure mechanical counter, also mounted on the front panel. The control marked COUPLING varies the inductance in the coupling coil, and the control marked TUNING varies the capacitance in the vacuum-tube and variable air-dielectric capacitors. Dial locks are provided for locking the controls.

Each antenna coupler is equipped with a directional coupler connected to a d-c microammeter, marked MATCH INDICATOR, mounted on the front panel. The microammeter is mounted in a shielded case and is connected to a toggle switch marked SENSITIVITY HIGH-LOW for varying meter indication to obtain optimum tuning.

A removable frame, with a lucite window, is provided to contain a calibration chart for tuning purposes, also a suitable receptacle marked INPUT is provided for plugging in the transmitter output.

Each antenna coupler is a drawer assembly which is guided into Cabinet, Electrical Equipment CY-1670/SRA by means of drawer slides. 2 guide pins are provided on each drawer assembly to guide the banana plugs of the antenna coupler into the proper receptacle of the vertical coaxial tube.

A shorting bar assembly with two dummy banana plugs is provided for each antenna coupler to close the circuit of the vertical coaxial tube when an antenna coupler is removed.

Each antenna coupler is held in position in the cabinet by six knurled thumbscrews which can be loosened from the front of the panel. Latch fasteners, provided on each side of the antenna coupler, are staggered to allow the drawer to be opened to different distances before complete removal.

b. COUPLER, ANTENNA CU-420/SRA-14.—Coupler, Antenna CU-420/SRA-14 is one of four identical antenna couplers used in Coupler Group, Antenna AN/SRA-14. It operates in the frequency range of 4—12 megacycles. It is similar to Coupler, Antenna CU-419/SRA-13.

c. COUPLER, ANTENNA CU-421/SRA-15.—Coupler, Antenna CU-421/SRA-15 is one of four identical antenna couplers used in Coupler Group, Antenna AN/SRA-15. It operates in the frequency range of

Figure 1-3. Panel, Fuse SB-406/SRA, Front Oblique View

6—18 megacycles. It is similar to Coupler, Antenna CU-419/SRA-13.

d. PANEL, FUSE SB-406/SRA.—Panel, Fuse SB-406/SRA (see figure 1-3) is used in all three coupler groups. It is located on the first deck of Cabinet, Electrical Equipment CY-1670/SRA.

Located on the front panel is a receptacle marked BLOWER INPUT 115v. 3A. 60~, to which the power source is connected. There are four fuse holders on the front panel. The two active fuses are located in the center bottom of the front panel and two spare fuses located on the lower left corner of the front panel. On the center of the front panel is an indicator lamp marked BLOWER VOLTAGE which lights when the blower is in operation.

The fuse panel is a drawer type assembly mounted on drawer slides. It is held in position in the cabinet by six knurled thumbscrews which can be loosened from the front of the panel. Latch fasteners are provided on each side of the fuse panel to prevent complete removal of the fuse panel unless the latch fasteners are disengaged.

e. CABINET, ELECTRICAL EQUIPMENT CY-1670/SRA.—Cabinet, Electrical Equipment CY-1670/SRA (see figure 1-4) consists of a steel cabinet with five decks, which are, from top to bottom, deck A, deck B, deck C, deck D, and the bottom deck.

Mounted on deck A is a blower assembly and associate air-conditioning filters. Deck A houses Panel, Fuse SB-406/SRA. The remaining four decks house the four antenna couplers. The four antenna couplers are interchangeable, within their respective cabinets, although they are normally placed so COUPLER NO. 1 is on deck B, COUPLER NO. 2 is on deck C, COUPLER NO. 3 is on deck D, and COUPLER NO. 4 is on the bottom deck.

Extending vertically through the inside center rear of the cabinet is the ventilating duct connecting the blower assembly on deck A with a blower outlet on each of the four lower decks. Louvres are provided on the sides of the cabinet for blower intake and outlet.

Also extending vertically through the inside rear right of the cabinet is a vertical coaxial line with plug-in receptacle at each deck. The center conductor of this 50-ohm coaxial line is connected to each receptacle. The vertical coaxial line is short circuited at the top, and equipped with a receptacle, marked OUTPUT at the lower right side of the cabinet for connection to the antenna.

The cabinet is equipped with four shock mounts for deck or bench mounting and two sway mounts at the top rear. Four eyebolts are provided at the top of the cabinet to facilitate moving the cabinet.

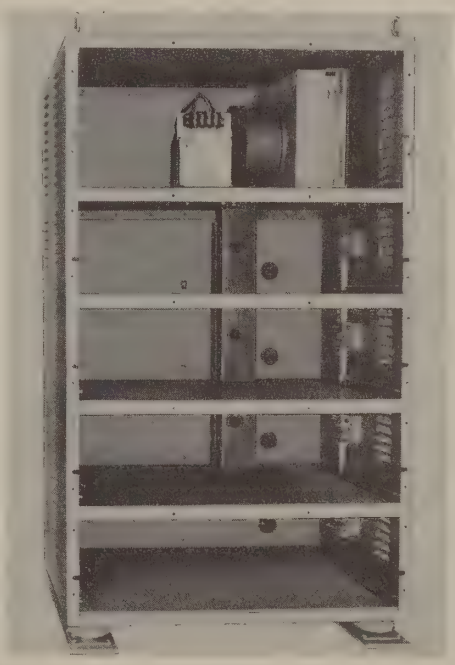


Figure 1-4. Cabinet, Electrical Equipment CY-1670/SRA, Left Oblique View

7. REFERENCE DATA.

a. NOMENCLATURE.—Coupler Group, Antenna AN/SRA-13; Coupler Group, Antenna AN/SRA-14; Coupler Group, Antenna AN/SRA-15.

b. CONTRACT NUMBER AND DATE.—NObsr-63422, 6 January 1953.

c. CONTRACTOR.—NEMS-CLARKE, INC., 919

Jesup-Blair Drive, Silver Spring, Maryland.

d. COGNIZANT NAVAL INSPECTOR.—Inspector of Naval Material, Silver Spring, Maryland.

e. NUMBER OF PACKAGES INVOLVED PER COMPLETE SHIPMENT.—One for each coupler group, not including equipment repair parts.

f. TOTAL CUBICAL CONTENTS.—See table 1–1.

g. TOTAL WEIGHT.—See tables 1–1 and 1–3.

h. FREQUENCY RANGE.—

(1) Coupler Group, Antenna AN/SRA-13, 2—6 mc.

(2) Coupler Group, Antenna AN/SRA-14, 4—12 mc.

(3) Coupler Group, Antenna AN/SRA-15, 6—18 mc.

i. TUNING BAND.—One band, continuously variable, across the frequency range of each coupler group.

j. TYPE OF FREQUENCY CONTROL.—Manual.

k. POWER HANDLING ABILITY.—Simultaneous coupling of 500 watts, r-f power, 100 percent amplitude modulated, from each of four transmitters to a single antenna.

l. INPUT IMPEDANCE.—50 ohms.

m. OUTPUT IMPEDANCE.—50 ohms.

n. EFFICIENCY.—

(1) Coupler Group, Antenna AN/SRA-13 not less than 70%.

(2) Coupler Group, Antenna AN/SRA-14, not less than 68%.

(3) Coupler Group, Antenna AN/SRA-15, not less than 60%.

o. VOLTAGE ISOLATION RATIO BETWEEN ADJACENT BANDS.—15 to 1.

p. ELECTRICAL CHARACTERISTICS OF ANTENNA.—Broadband with impedance characteristic such that VSWR does not exceed 3 to 1, related to 50 ohms, across the frequency range.

q. POWER SUPPLY FOR BLOWER ASSEMBLY.—115V, single phase, 60 cycles.

r. FOR USE WITH TRANSMITTERS.—Model TBM, TBK, TCK, AN/URT-2, 3, 4 and AN/SRT-14, 15, 16.

8. EQUIPMENT SUPPLIED.

TABLE 1-1. EQUIPMENT SUPPLIED

Quantity Per Equipment	Name of Unit	Navy Type Designation	Over-All Dimensions			Volume	Weight
			Height	Width	Depth		
WITH COUPLER GROUP, ANTENNA AN/SRA-13							
1	Coupler, Group	AN/SRA-13	46 3/4	26 1/4	20 1/2		176 1/2
4	Coupler, Antenna	CU-419/SRA-13	7 23/32	24 3/4	18 3/16		43 ea
1	Panel, Fuse	SB-406/SRA	11 7/32	24 3/4	10 3/8		11 1/2
1	Cabinet, Electrical Equipment	CY-1670/SRA	46 3/4	26 1/4	20 1/2		122 1/2
2	Instruction book	NAVSHIPS					
WITH COUPLER GROUP, ANTENNA AN/SRA-14							
1	Coupler, Group	AN/SRA-14	46 3/4	26 1/4	20 1/2		176 1/2
4	Coupler, Antenna	CU-420/SRA-14	7 23/32	24 3/4	18 3/16		36 1/2 ea
1	Panel, Fuse	SB-406/SRA	11 7/32	24 3/4	10 3/8		11 1/2
1	Cabinet, Electrical Equipment	CY-1670/SRA	46 3/4	26 1/4	20 1/2		122 1/2
2	Instruction book	NAVSHIPS					

TABLE 1-1. EQUIPMENT SUPPLIED—Continued

Quantity Per Equipment	Name of Unit	Navy Type Designation	Over-All Dimensions			Volume	Weight
			Height	Width	Depth		
WITH COUPLER GROUP, ANTENNA AN/SRA-15							
1	Coupler, Group	AN/SRA-15	46 3/4	26 1/4	20 1/2		176 1/2
4	Coupler, Antenna	CU-421/SRA-15	7 23/32	24 3/4	18 3/16		35 1/2 ea
1	Panel, Fuse	SB-406/SRA	11 7/32	24 3/4	10 3/8		11 1/2
1	Cabinet, Electrical Equipment	CY-1670/SRA	46 3/4	26 1/4	20 1/2		122 1/2
2	Instruction book	NAVSHIPS					

Unless otherwise stated, dimensions are in inches, volume is in cubic feet, and weight is in pounds.

9. EQUIPMENT REQUIRED BUT NOT SUPPLIED.

The following table lists equipment required but not supplied for one coupler group.

TABLE 1-2. EQUIPMENT REQUIRED BUT NOT SUPPLIED.

Quantity Per Equipment	Name of Unit	Navy Type Designation	Required Use	Required Characteristics
4	Coaxial line	RG-10/U or RG-18/U	Transmitter	Length as reqd
4	Coaxial line	RG-10/U	*	1—2 ft
1	Coaxial line	RG-18/U	Antenna	Length as reqd
4	Adapter	UG-982/U	*	Or equal
4	Connector	UG-23/U	*	Or equal
4	Connector	UG-941A/U	Transmitter	Or equal
4	Connector	UG-27A/U	*	Or equal
1	Connector	UG-154/U	Antenna	Or UG-216/U
1	Power line	As reqd	Blower	Length as reqd
1	Primary power switch	As reqd	On-Off switch	6 amp toggle switch

* Used only when item 1 is RG-18/U.

10. SHIPPING DATA.

TABLE 1-3. SHIPPING DATA

Shipping Container No.	Contents		Over-All Dimensions			Volume	Weight
	Name	Designation	Height	Width	Depth		
1	Coupler Group, Antenna	AN/SRA-13	51	29	22	18.8	416
1	Coupler Group, Antenna	AN/SRA-14	51	29	22	18.8	390
1	Coupler Group, Antenna	AN/SRA-15	51	29	22	18.8	386

Unless otherwise stated, dimensions are in inches, volume is in cubic feet, and weight is in pounds.

11. BASIC SIMILARITIES IN COUPLER GROUPS, ANTENNA AN/SRA SERIES.

TABLE 1-4. BASIC SIMILARITIES IN COUPLER GROUPS, ANTENNA AN/SRA SERIES

Model	Frequency Range (mc)	Coupler, Antenna	Panel Fuse	Cabinet, Electrical Equipment	Power Supply	Instruction Book (Navships)
AN/SRA-13	2 to 6	CU-419/SRA-13	SB-406/SRA	CY-1670/SRA	115v, ac	92746
AN/SRA-14	4 to 12	CU-420/SRA-14	SB-406/SRA	CY-1670/SRA	115v, ac	92746
AN/SRA-15	6 to 18	CU-421/SRA-15	SB-406/SRA	CY-1670/SRA	115v, ac	92746

SECTION 2

THEORY OF OPERATION

1. INTRODUCTION.

a. GENERAL.—Since all coupler groups are similar, except for differences in circuit components required for various frequency ranges, only Coupler Group, Antenna AN/SRA-13 will be discussed.

As described in Section 1, paragraph 5*b*, each of the three types of coupler groups is made up of four identical antenna couplers. Each antenna coupler, of any coupler group, is capable of being tuned to any frequency within its frequency range of the coupler group. This being 2—6 mc for Coupler, Antenna CU-419/SRA-13 in Coupler Group, Antenna AN/SRA-13; 4—12 mc for Coupler, Antenna CU-420/SRA-14 in Coupler Group, Antenna AN/SRA-14, and 6—18 mc for Coupler, Antenna CU-421/SRA-15 in Coupler Group, Antenna AN/SRA-15. To obtain optimum efficiency of transfer of power and voltage isolation ratio between adjacent frequency bands, the highest frequency used in any one coupler group is assigned to the topmost antenna coupler in the cabinet, this being COUPLER NO. 1. Conversely, the antenna coupler operating at the lower frequency in any one coupler group should be on the bottom deck, this being COUPLER NO. 4. The operating frequencies of the other two antenna couplers, these being COUPLER NO. 2 and COUPLER NO. 3, should be graduated accordingly. For ease in identification and operation, transmitter No. 1 is connected to COUPLER NO. 1, transmitter No. 2 is connected to COUPLER NO. 2, transmitter No. 3 is connected to COUPLER NO. 3, and transmitter No. 4 is connected to COUPLER NO. 4.

b. DESCRIPTION OF CIRCUITS.—Figure 2–1 is a functional diagram of Coupler Group, Antenna AN/SRA-13. Although the blower assembly and fuse panel are not shown, these units do not affect the function of the coupler group; they will be discussed.

(1) COUPLER NO. 1.—The four antenna couplers (Coupler, Antenna CU-419/SRA-13) are identical, therefore only COUPLER NO. 1 will be discussed in detail.

The output signal of transmitter No. 1 is fed through a 50-ohm coaxial line, RG-10/U or RG-18/U, through receptacle J1. The signal is then fed through a match indicator circuit to the input impedance matching and coupling circuit, through receptacle J2, connector P2, and coaxial cable W1. When the impedance matching and coupling circuit is tuned to the operating frequency, by means of the TUNING and COUPLING controls, maximum signal is coupled to the 50-ohm r-f transmission line through connector P1 and receptacle J301. The signal is then fed to a broadband antenna.

The match indicator circuit is comprised of a directional coupler, DC1, and a microammeter, M1, marked MATCH INDICATOR. A portion of the transmitter signal reflected back toward the transmitter by the antenna coupler is coupled to the directional coupler DC1, where it is rectified and fed to a microammeter. Microammeter M1 indicates the relative magnitude of r-f voltage being reflected back toward the transmitter by the antenna coupler.

The input impedance matching and coupling circuit consists of a number of capacitors and a coil in parallel. It is adjusted to resonance by the TUNING and COUPLING controls. The impedance matching and coupling circuit is coupled through the 50-ohm r-f transmission line to the broadband antenna by a one turn adjustable coupling loop, marked COUPLING, inside a nonadjustable coil.

(2) COUPLER NO. 2.—COUPLER NO. 2 is one of four identical antenna couplers used in Coupler Group, Antenna AN/SRA-13, and its operation is identical to COUPLER NO. 1 described in subparagraph (1) above.

(3) COUPLER NO. 3.—COUPLER NO. 3 is one of four identical antenna couplers used in Coupler Group, Antenna AN/SRA-13, and its operation is identical to COUPLER NO. 1 described in subparagraph (1) above.

(4) COUPLER NO. 4.—COUPLER NO. 4 is one of four identical antenna couplers used in Coupler Group, Antenna AN/SRA-13, and its operation is identical to COUPLER NO. 1 described in subparagraph (1) above.

(5) CABINET, ELECTRICAL EQUIPMENT CY-1670/SRA.—Cabinet, Electrical Equipment CY-1670/SRA houses four antenna couplers, Panel, Fuse SB-406/SRA, a vertical coaxial tube, and a blower assembly.

Extending vertically through the inside rear right of the cabinet is a vertical coaxial line W301. The two terminals of the coupling loop are connected by connector P1 and receptacle J301 to the inner conductor of the vertical coaxial line. One end of this coaxial line is short circuited. The other end terminates in antenna line connector J302. The inner conductor is connected in series to the coupling loop terminals. Shorting bar E3 shorts receptacles J301 when an antenna coupler is removed from the cabinet, thus the 50-ohm r-f transmission line remains a closed circuit.

(6) BLOWER ASSEMBLY.—The blower assembly mounted on deck A is identical in all coupler groups. Its function is to cool all antenna couplers in each

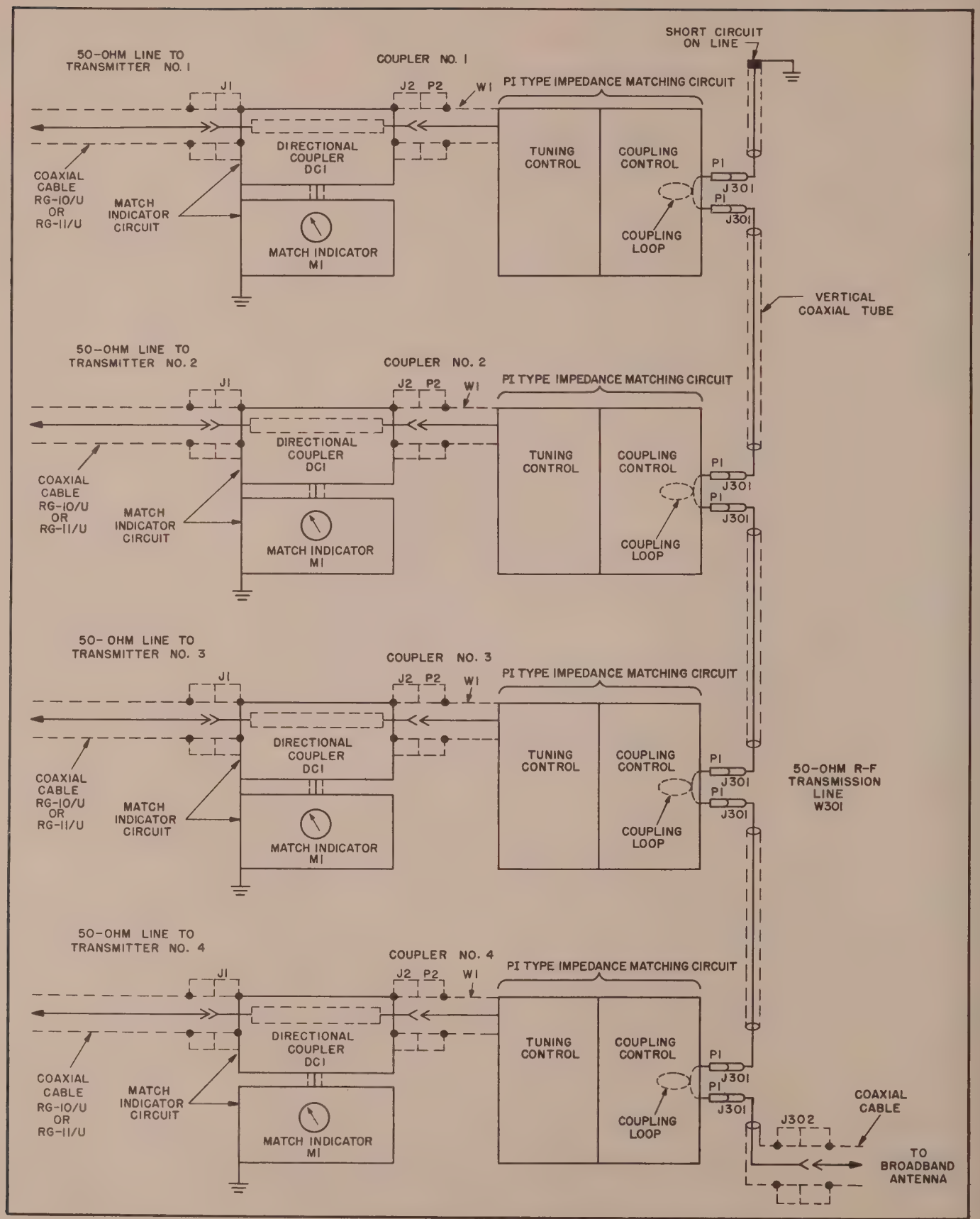


Figure 2-1. Coupler Group, Antenna AN/SRA-13, Functional Block Diagram

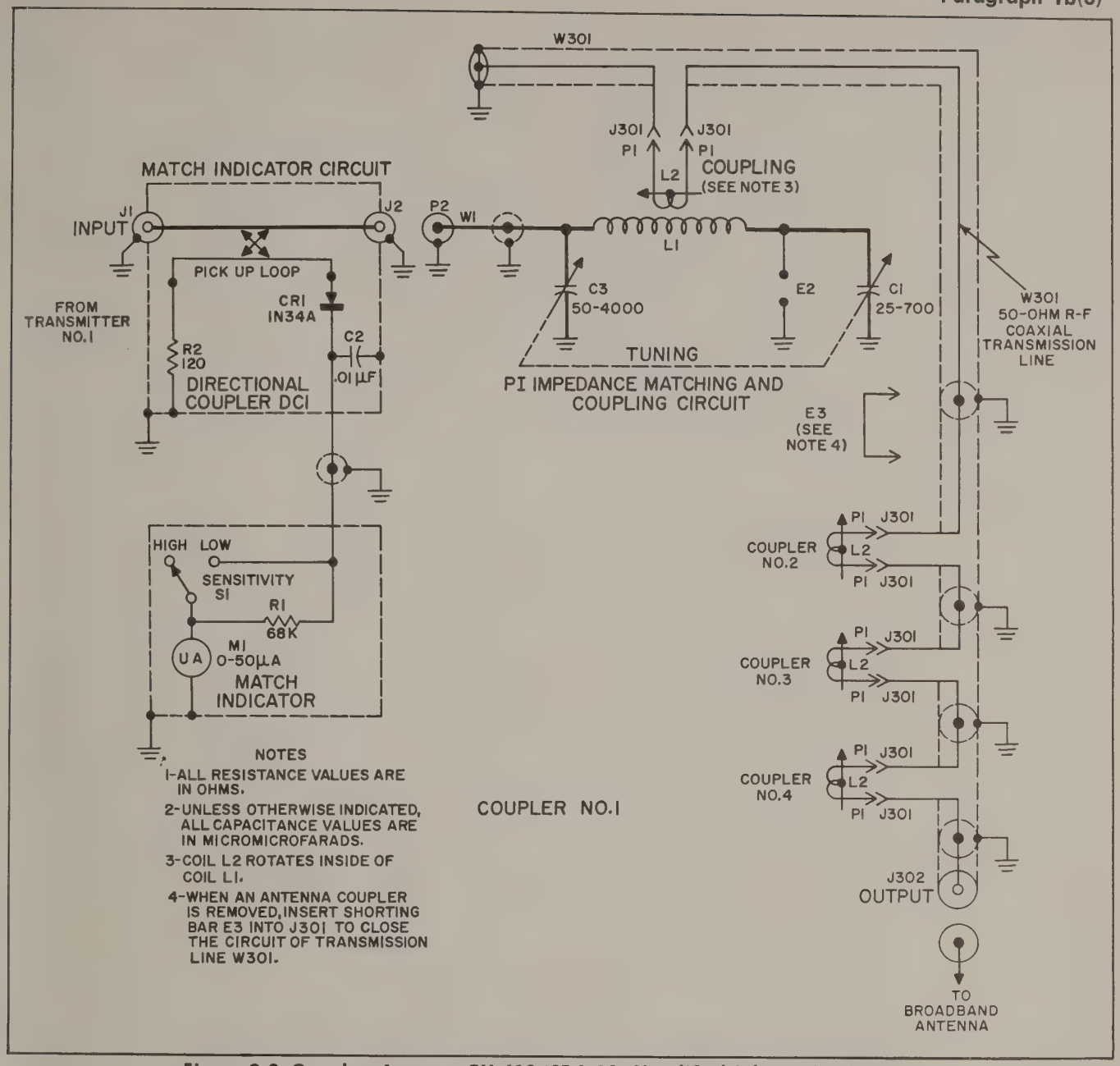


Figure 2-2. Coupler, Antenna CU-419/SRA-13, Simplified Schematic Diagram

coupler group.

(7) PANEL, FUSE SB-406/SRA.—Panel, Fuse SB-406/SRA mounts four fuses, two of which protect the blower assembly and two are used as spares. An indicator lamp glows when the blower is operating. Also mounted on the fuse panel is a receptacle, J201, for connecting the blower to a power source.

2. CIRCUIT ANALYSIS.

a. GENERAL.—The design and operation of the coupler groups are essentially the same except for certain modifications in the electrical characteristics of the equipment which produce the three frequency ranges described in paragraph 1*a* above. Therefore in the following discussion of the theory of operation, reference should be made to figure 2–2 for a simplified schematic diagram of the Coupler, Antenna CU-419/SRA-13 used in Coupler Group, Antenna AN/SRA-13.

There are four identical antenna couplers used in each coupler group, therefore, only one antenna coupler of each coupler group will be discussed. Four transmitters may be operated simultaneously at different frequencies within the frequency range of a specific coupler group. In order to keep interaction between adjacent operating frequencies in a specific coupler group to a minimum, a frequency separation of at least 10 percent is maintained. Transmitter No. 1 is connected to COUPLER NO. 1, transmitter No. 2 is connected to COUPLER NO. 2, transmitter No. 3 is connected to COUPLER NO. 3, and transmitter No. 4 is connected

to COUPLER NO. 4.

b. COUPLER, ANTENNA CU-419/SRA-13.—Coupler, Antenna CU-419/SRA-13, operating in the frequency range of 2—6 megacycles is used in Coupler Group, Antenna AN/SRA-13, and is represented schematically in figure 2–2. It consists of a match indicator circuit, and an input impedance matching and coupling circuit. Each circuit is discussed in the following paragraphs.

The signal from each r-f transmitter is fed through its associated receptacle, J1, marked INPUT, through a match indicator circuit into an impedance matching circuit. The signal is then coupled to a 50-ohm r-f transmission line and then fed to a broadband antenna.

(1) INPUT IMPEDANCE MATCHING CIRCUIT AND OUTPUT COUPLING CIRCUIT.—The purpose of this circuit is to match the 50-ohm impedance of the transmission line from the transmitter to the antenna impedance appearing at the output terminal of the coupler group.

Input capacitor C3 is an air-dielectric, plate-meshing type capacitor with two sections in parallel, each section having a variable capacitance of 50—4000 micromicrofarads. Capacitor C1 is a vacuum type capacitor with a variable capacitance of 25—700 micromicrofarads. Coil L1 is a fixed coil of 11 turns of nilvar rod, 0.128 inch rod diameter, 4⅜ inch inside coil diameter. Coil L2 is a single turn, or ring of Nilvar, ½ inch wide, 0.062 inch thick, and 4 inches inside coil diameter.

The two variable capacitors, C1 and C3, are operated in unison by the control marked TUNING, which is geared to a mechanical counter in the ratio that one full turn of the TUNING control registers 10 units on the dial of the mechanical counter. The TUNING control is locked by turning a separate knob, located below the TUNING control, clockwise, and unlocked by turning the knob counterclockwise. Coupling loop L2 is rotated inside coil L1 by control knob marked COUPLING which is geared to a mechanical counter in the same manner and in the same ratio as the TUNING control.

The two terminals of coupling loop L2 are connected to the 50-ohm r-f transmission line W301, which is part of vertical coaxial tube, by connectors P1 and receptacles J301. One end of the coaxial line is short circuited. The other end terminates in antenna line connector J302. Part of the outer conductor of vertical coaxial tube is cut away where it passes the terminals of coupling loop L2 of COUPLER NO. 2, COUPLER NO. 3, and COUPLER NO. 4. The inner conductor of this vertical coaxial line is severed in four places along its length and is connected to receptacle J301. When all four antenna couplers are in place, their associated coupling loops, L2, are connected, by connector P1 and receptacle J301, to the 50-ohm r-f transmission line. A suitable shorting bar, E3, is provided for each antenna coupler to complete the transmission line circuit when an antenna coupler is removed.

Power from the r-f transmitter is coupled through the circuit to the antenna transmission line with a transfer efficiency of not less than 70 percent. The current in the 50-ohm r-f transmission line from any one antenna coupler induces a voltage in the impedance matching and coupling circuits of the other three antenna couplers of the same coupler group. The impedance matching and coupling circuits of the other three couplers are tuned to different frequencies and have only a small circulating current, therefore, a very low voltage is induced across capacitor C3 and the INPUT terminals of the other three antenna couplers. The voltage isolation ratio (voltage at the INPUT terminal of one operating antenna coupler divided by the voltage appearing at the INPUT terminal of another operating antenna coupler) is approximately 15-to-1 (23.5 db). Each antenna coupler transfers power at its own operating frequency into the antenna transmission line, but rejects the flow of power into it at other frequencies. At its own frequency, however, it will pass power in either direction.

Reactance, which is reflected into the impedance matching circuit by coupling loop L2, is neutralized by tuning capacitor C1. Tuning capacitor C1 and input capacitor C3 are ganged to a single control and maintain a nearly constant ratio of capacitance over the entire frequency range of the antenna coupler. The capacitance ratio is such that when coupling loop L2 is properly adjusted for a given frequency and antenna impedance, the tuning and input capacitors, C1 and C3 respectively, can be simultaneously tuned to resonate the impedance matching and coupling circuit and provide a 50-ohm resistive input impedance, matching the 50-ohm characteristic impedance of the antenna transmission line.

E2 is an electric surge arrester which is mounted under the tuning capacitor (vacuum type) C3 to ground high surges of current during tuning operations.

(2) MATCH INDICATOR CIRCUIT.—The match indicator circuit (see figure 2–2) of each antenna coupler is a special reflectometer which is connected in series with the transmission feed line. Its function is to detect the flow of r-f energy in one direction only, and thereby indicate the relative magnitude of r-f voltage being reflected back toward the transmitter from the coupler. When the antenna coupler is properly tuned, it presents approximately 50 ohms resistance at its input terminal, thus matching the 50-ohm impedance of the transmission line from the transmitter. This results in zero reflected power from the coupler, causing the microammeter marked MATCH INDICATOR to indicate minimum. The objective, therefore, when tuning is to adjust each antenna coupler at its proper operating frequency for a minimum indication on MATCH INDICATOR microammeter M1. The match indicator circuit consists of a directional coupler DC1 and a metering circuit which are discussed in the following paragraphs.

(*a*) DIRECTIONAL COUPLER.—Directional coupler DC1 consists of a rectangular metal box which forms a portion of the transmission line outer conductor; an inner conductor of enlarged diameter; a pick-up loop which is parallel to the inner conductor, crystal

detector CR1, resistor R2, and capacitor C2.

The inner conductor of the transmission line is enlarged in diameter and insulated from the outer conductor, which is the metal box, to maintain the 50-ohm characteristic impedance of the transmission line. A signal flowing through the enlarged inner conductor creates a magnetic field around the inner conductor. The magnetic field induces a voltage in the pick-up loop. Proper spacing between the pick-up loop and the inner conductor, and the proper selection of the value of resistor R2, results in a balance in the inductive and capacitive components of the energy induced in the pick-up loop over the frequency range of the antenna coupler. Therefore, the resultant current in the pick-up loop is too small to cause an indication on MATCH INDICATOR microammeter M1, which is part of the meter circuit. When the impedance matching and coupling circuit is not tuned to the operating frequency, a mismatch between the antenna and antenna coupler exists which upsets the balance and induces a voltage in the pick-up loop. The resultant current induced in the pick-up loop is rectified by crystal detector CR1 and fed to the MATCH INDICATOR microammeter M1.

(*b*) METER CIRCUIT.—The meter circuit consists of MATCH INDICATOR microammeter M1, HIGH-LOW SENSITIVITY switch S1 and limiting resistor R1, all of which are enclosed in a metal shield.

When the impedance matching and coupling circuit is tuned to the operating frequency of the transmitter, the MATCH INDICATOR microammeter M1 indicates a minimum current. When the impedance matching and coupling circuit is not tuned to the transmitter operating frequency, the resultant current in the pick-up loop is rectified by crystal detector CR1 and is indicated on MATCH INDICATOR microammeter M1. Therefore, the impedance matching and coupling circuit should be tuned for a minimum indication on MATCH INDICATOR microammeter M1.

Limiting resistor R1 and HIGH-LOW SENSITIVITY switch S1 provide for a high-low sensitivity adjustment. When HIGH-LOW SENSITIVITY switch S1 is in HIGH position, current to microammeter M1 is limited to a safe value. Capacitor C2 is an r-f bypass capacitor for microammeter M1.

Since the match indicator circuit indicates reflected power toward the transmitter, microammeter M1 will indicate a value of current when power from another transmitter is coupled to the antenna coupler. Furthermore, since the antenna coupler provides for a matched condition only for the frequency to which it is tuned, harmonics or spurious frequencies in the output of the transmitter connected to the antenna coupler will be reflected and, if they are of sufficient amplitude, will cause the MATCH INDICATOR microammeter M1 to deflect.

(3) MECHANICAL TUNING SYSTEM.—The following paragraphs will aid in understanding the function and connection which make up the mechanical tuning system.

(*a*) TUNING CONTROL (See figure 7-5).—As the TUNING control rotates, bevel gear O-36 mounted on drive shaft O-55, rotates to drive bevel gear O-37, mounted on one end of shaft O-56. On the other end of shaft O-56 is bevel gear O-38 which drives a matched bevel gear O-39. Bevel gear O-39 drives TUNING control counter M2.

Drive shaft O-55 is coupled by coupling O-26 to worm gear drive shaft O-27. As drive shaft O-55 is rotated, worm gear drive shaft O-27 turns worm gears O-29 and O-28 which rotate the two sections of variable capacitor C3. Gear stops O-31 and O-32 prevent the worm gear from overshooting.

Worm gear drive shaft O-27 is coupled by coupling O-26 to helical gear drive shaft O-23, which is part of the gear train assembly. Helical gear O-20 is mounted on helical gear drive shaft O-22 and is held in position by two bushings O-24 and O-25. As helical gear O-20 rotates, it turns helical gear drive shaft O-22 which is coupled by coupling O-18 to the shank end of vacuum capacitor C1, thereby driving the vacuum capacitor.

(*b*) COUPLING CONTROL (See figure 7-5).—As the COUPLING control is rotated, miter gear O-16 mounted on drive shaft O-12, rotates to drive a matched miter gear O-16 mounted on one end of counter drive shaft O-42. On the other end of counter drive shaft O-42 is miter gear O-17 which rotates a matched miter gear O-17 of COUPLING control counter M2.

Drive shaft O-12 is coupled by flexible coupling O-11 to worm drive shaft O-8. Mounted on worm drive shaft O-8 is worm O-4 which turns worm gear O-3. Worm gear O-3 rotates coil L2 inside coil L1. Gear stop O-6 engages stop O-7 to prevent coil L2 from overshooting.

c. COUPLER, ANTENNA CU-420/SRA-14.—Coupler, Antenna CU-420/SRA-14, operating in the frequency range of 4—12 megacycles is used in Coupler Group, Antenna AN/SRA-14. It consists of a match indicator circuit, and an input impedance matching and coupling circuit.

Operation of Coupler, Antenna CU-420/SRA-14 is identical to the operation of Coupler, Antenna CU-419/SRA-13 discussed in paragraph 2*b*.

The difference between Coupler, Antenna CU-420/SRA-14 and Coupler, Antenna CU-419/SRA-13 is in circuit components due to the different frequency ranges. Input capacitor C4 is variable from 50 to 5000 micromicrofarads and in parallel with it are three fixed capacitors, C2, C5 and C6, to provide better tracking. Tuning capacitor C3 is variable from 10 to 300 micromicrofarads. Coils L1 and L2 have the same number of turns but are of different physical size from coils L1 and L2 in Coupler, Antenna CU-419/SRA-13. Capacitor C1 is an r-f bypass capacitor for MATCH INDICATOR microammeter M1.

Power from the transmitter is coupled to the antenna transmission line with a transfer efficiency of not less than 68 percent as compared to 70 percent for Coupler, Antenna CU-419/SRA-13.

d. COUPLER, ANTENNA CU-421/SRA-15.—Coupler, Antenna CU-421/SRA-15, operating in the frequency range of 6—18 megacycles is used in Coupler Group, Antenna AN/SRA-15. It consists of a match indicator circuit and an input impedance matching and

coupling circuit.

Operation of Coupler, Antenna CU-421/SRA-15 is identical to the operation of Coupler, Antenna CU-419/SRA-13 discussed in paragraph 2*b*.

The difference between Coupler, Antenna CU-421/SRA-15 and Coupler, Antenna CU-419/SRA-13 is in circuit components due to the different frequency ranges. Input capacitor C4 is variable from 50 to 5000 micromicrofarads and in parallel with it are two fixed capacitors C2 and C5, to provide better tracking. Tuning capacitor C3 is variable from 10 to 300 micromicrofarads. Coil L1 has one turn of Nilvar rod and coil L2 has 6 turns of Nilvar rod and are of different physical size from coils L1 and L2 in Coupler, Antenna CU-419/SRA-13. Capacitor C1 is an r-f bypass capacitor for MATCH INDICATOR microammeter M1.

Power from the transmitter is coupled to the antenna transmission line with a transfer efficiency of not less than 60 percent as compared to 70 percent for Coupler, Antenna CU-419/SRA-13.

e. PANEL, FUSE SB-406/SRA.—Panel, Fuse SB-406/SRA is used in Coupler Group, Antenna AN/SRA-13, Coupler Group, Antenna AN/SRA-14, and Coupler Group, Antenna AN/SRA-15. A 115-volt, 60 cycle, a-c power source is connected to receptacle J201. Both sides of the a-c line leading to terminals 1 and 4 of a terminal board TB301 mounted in the cabinet are fused with F201 and F202. Across the a-c line is BLOWER VOLTAGE indicator lamp, I201, which is illuminated when the blower motor is in operation.

f. CABINET, ELECTRICAL EQUIPMENT CY-1670/SRA.—Cabinet, Electrical Equipment CY-1670/SRA is a steel constructed, five deck cabinet which houses the five removable units—four antenna couplers and a fuse panel.

Located on deck A, the uppermost deck, is a blower assembly which provides forced ventilation to cool the antenna couplers located in the remaining four decks. The blower assembly consists of motor B301 and associated air-conditioning filters FL301, and fixed capacitor C301 which eliminates interference caused by the blower motor. Terminal Board TB301 is mounted on the capacitor to terminate the red and green wires extending from the fuse panel to the blower assembly. These wires are equipped with spade lugs to facilitate their disconnection at the fuse panel when the fuse panel drawer is removed from the cabinet. A suitable switch must be provided at some suitable location near the cabinet for starting and stopping the blower motor.

3. CHANNEL SEPARATION.

In order to keep interaction between adjacent channels in a specific coupler group to a minimum, a channel separation of at least 10 percent should be maintained. For example, if COUPLER NO. 3 in Coupler Group, Antenna AN/SRA-13 is tuned to operate at a frequency of 3 megacycles, the two antenna couplers, COUPLER NO. 2 and COUPLER NO. 4, nearest in frequency in the same coupler group should be tuned to operate at frequencies no closer than 2.7 megacycles and 3.3 megacycles. Such channel separation results in a minimum voltage-isolation ratio of about 15 to 1, or an equivalent of 23.5 db, in which the interaction between antenna couplers is negligible.

SECTION 3

INSTALLATION

1. UNPACKING.

Each coupler group is packed in one container consisting of a wooden box bolted to a platform mounted on skids. To unpack the equipment remove the nails around the top of the box with a nail puller and remove the top of the box. Remove the four bolts through the shock mounts and box sides and remove the box sides. Remove the four bolts holding the equipment to the platform. Using a hoist or by inserting lifting bars through the eyebolts at the top of the cabinet, place the equipment in the desired location. Remove all padding from around the equipment and clean away all dust and dirt. This includes the inside of the drawer assemblies. Release the knurled panel screws, withdraw each of the drawers to the stop and inspect the equipment for any damage which may have occurred in shipment. Report any damage and make repairs before installation.

2. INSTALLATION.

The installation procedure for Antenna Coupler Group AN/SRA-13, AN/SRA-14, and AN/SRA-15 is identical.

a. GENERAL.—The coupler group is designed for mounting in an upright position on a bench or on the deck. Bench mounting is considered preferable both for ease in mounting and for bringing the control knobs, counters, and other instruments to a more convenient operating level. The coupler group should be located in the radio transmitter room, near the transmitters to which it is to be connected.

b. LOCATION.—See figure 3–1 for an outline and mounting dimension drawing of Cabinet, Electrical Equipment CY-1670/SRA.

Approximately 15 inches clearance must be provided at the right side of the cabinet for ventilation and for access to the antenna transmission line receptacle. A minimum of 3-inches clearance should be provided on the left side of the cabinet for ventilation.

A bracket or plate must be installed on the bulkhead or other support for securing the upper rear shock mounts. The equipment is secured to the bench or deck by means of two plates to which the four shock mounts are attached at the bottom of the cabinet. Hexagonal-head bolts or cap screws, $\frac{3}{8}$-16, should be used for securing the cabinet mounting plates to the bench, or deck, and to the bulkhead. A total of 14 bolts, $1\frac{1}{2}$ inches long with nuts and lockwashers are required. Make certain that the cabinet is level, to ensure smooth-working control shafts.

(1) ANTENNA COUPLERS.—Ascertain that the antenna coupler drawers are inserted in the cabinet, in the proper order, as shown in figure 3–1, i.e., numbering 1, 2, 3, 4 from top to bottom. Release the panel thumb screws and withdraw the drawers to the stop check to see that the short coaxial cable between directional coupler DC1 and input capacitor of the input impedance matching and coupling circuit are properly connected. Operate the controls and observe if the variable capacitors and output-coupling loop change position. Push the drawers into the cabinet and tighten the knurled thumbscrews securing the front panel.

(2) PANEL, FUSE SB-406/SRA.—Release the four knurled panel screws in the fuse panel and withdraw the panel to the stop. Note if the two leads to the blower voltage indicator lamp are connected to the terminal board near the blower motor. If not, connect the two spade terminated leads from the lamp to terminals 1 and 4 of the terminal board, TB301 (see figure 3–2).

3. INSTALLATION OF CABLES.

a. GENERAL.—Figure 3–2 illustrates the cable assemblies connected to a coupler group. There are no critical lengths of coaxial transmission line; however, it is always good practice to keep these lines as short as possible.

b. CARE OF CABLES.—Run the cable assemblies so that they will be protected from damage, avoid pressing them against sharp edges and never subject coaxial cable to excessive pressure or bends. Each cable should be mechanically supported at frequent intervals throughout its entire length.

c. TRANSMISSION LINE (INPUT) CABLE ASSEMBLY.—When the transmitter output cable (item 1 of figure 3–2) is type RG-10/U coaxial line, connect its terminating plug to angle adapter UG-27A/U. Connect the angle adapter to the INPUT receptacle of the antenna coupler.

When the output cable of the transmitter is type RG-18/U coaxial line, a special cable assembly must be constructed. Cut a 2-foot length of type RG-10/U coaxial line. Terminate one end in a type UG-941A/U connector and terminate the other end in a type UG-940A/U receptacle. Assemble a type UG-982/U adapter on the type RG-18/U antenna line. The UG-940A/U receptacle and the UG-982/U will then mate. Connect the UG-941A/U fitting to a UG-27A/U transmitter output cable right-angle adapter and connect this to the antenna coupler input receptacle.

d. TRANSMISSION LINE (OUTPUT) CABLE

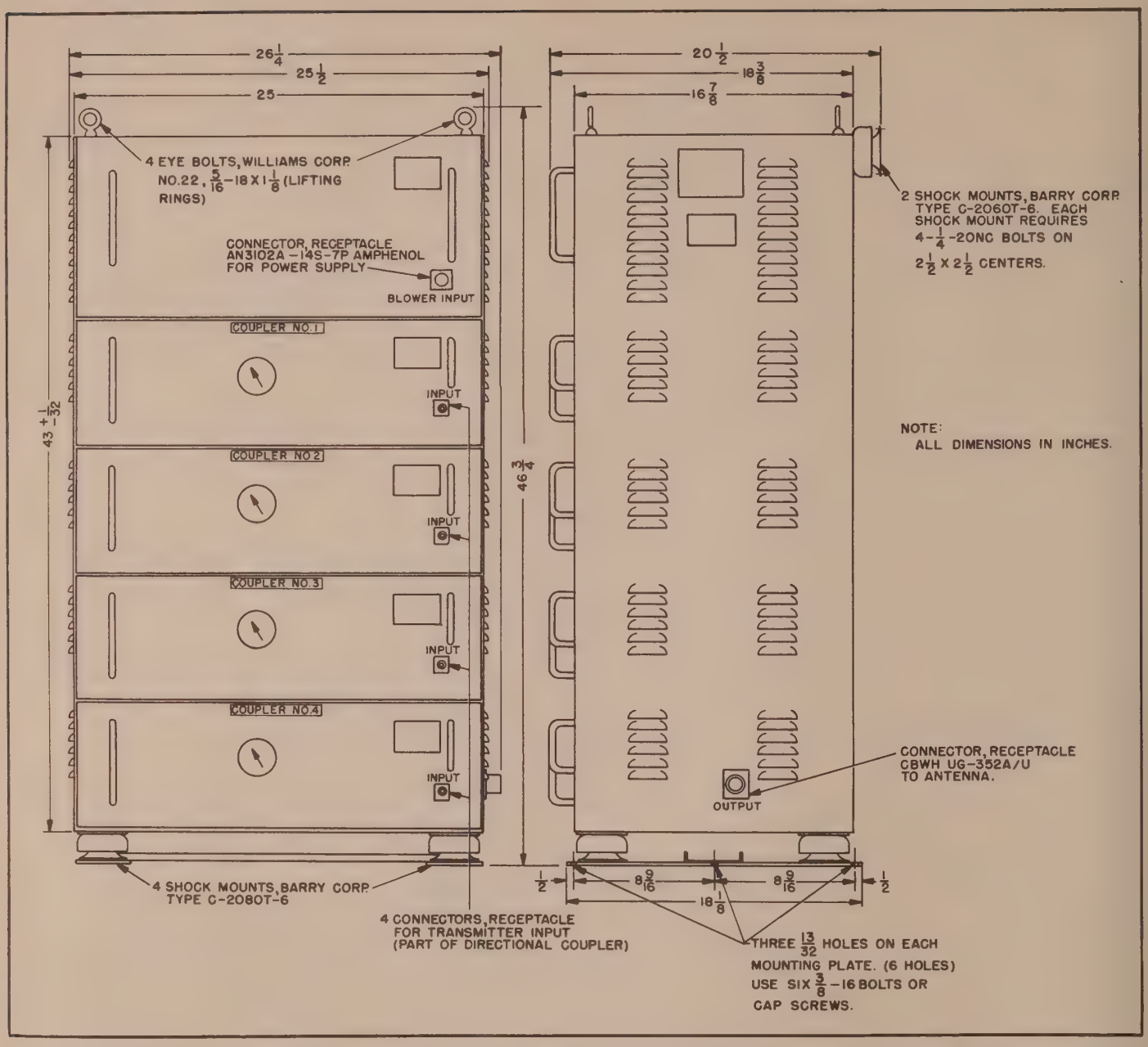


Figure 3-1. Coupler Group, Antenna AN/SRA-13, 14, and 15, Outline and Mounting Dimensions

ASSEMBLY.—Terminate the end of the type RG-18/U antenna transmission line with a type UG-154/U cable connector. Connect to this a UG-216/U right-angle adapter. This fitting (figure 3–3) will then mate with the output receptacle J302, a UG-352A/U fitting, located at the lower right side of the cabinet.

e. POWER SUPPLY CABLE ASSEMBLY.—Terminate one end of a suitable length of three conductor cable type TCOP-3 with the AN3018B-14S-7S Amphenol 90-degree angle connector, P201. Tighten cable clamp T201. Connect P201 to the BLOWER INPUT receptable J201 on the fuse panel. Connect the other end of this cable to a 115-volt, 60-cycle, single-phase, a-c power supply.

f. GROUNDING STRAP.—Ground Cabinet, Electrical Equipment CY-1670/SRA to the deck or bench, using a flexible copper grounding strap.

4. POWER DISTRIBUTION.

The power distribution system in these antenna coupler groups is restricted to the fuse panel and blower assembly (figure 7–12).

5. INITIAL ADJUSTMENTS.

a. GENERAL.—The following adjustments are made after the equipment is completely installed. It is assumed that the equipment has been properly connected. If difficulty is experienced in obtaining the results specified in these procedures, refer to the adjustments and cor-

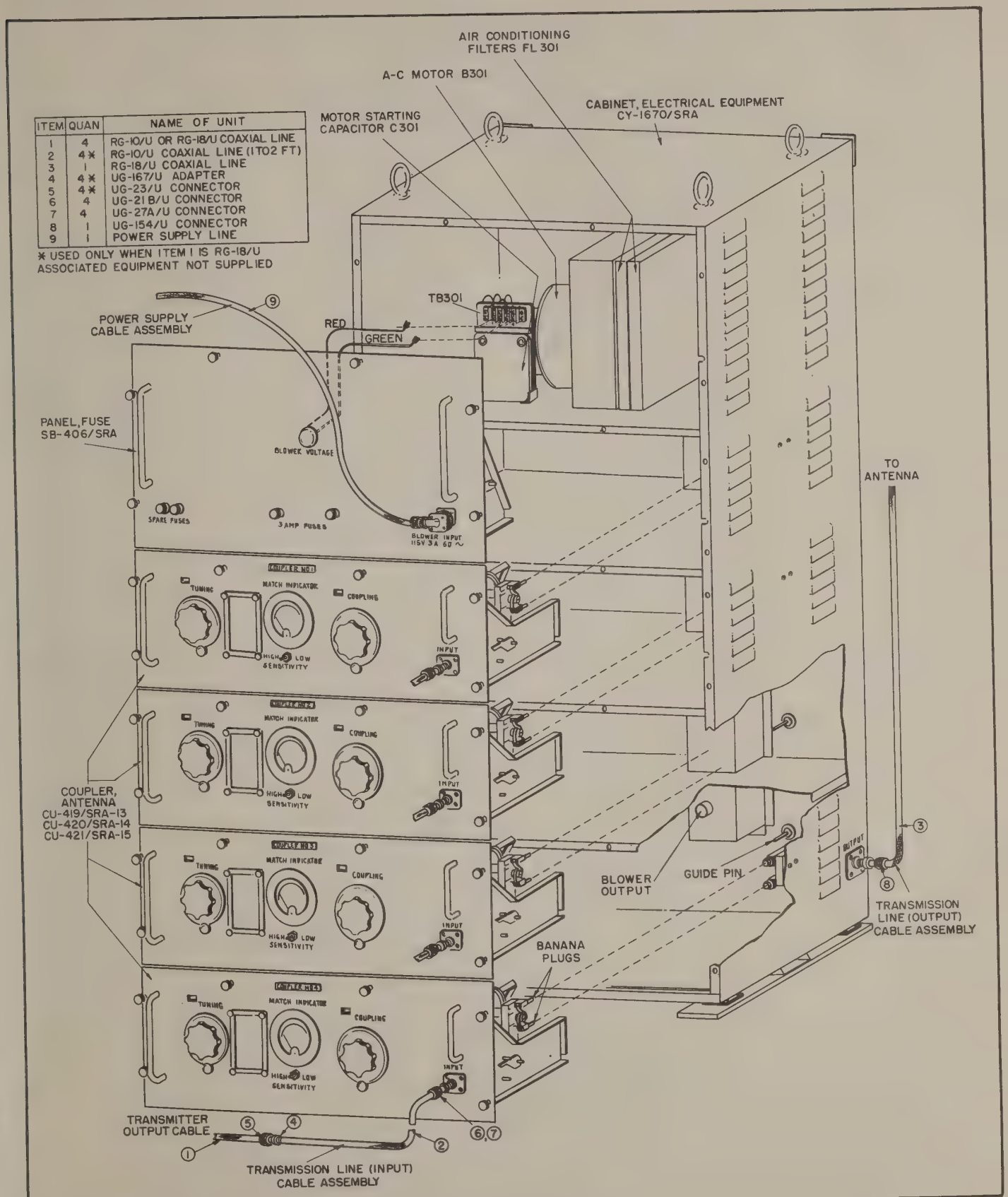


Figure 3-2. Installation Details

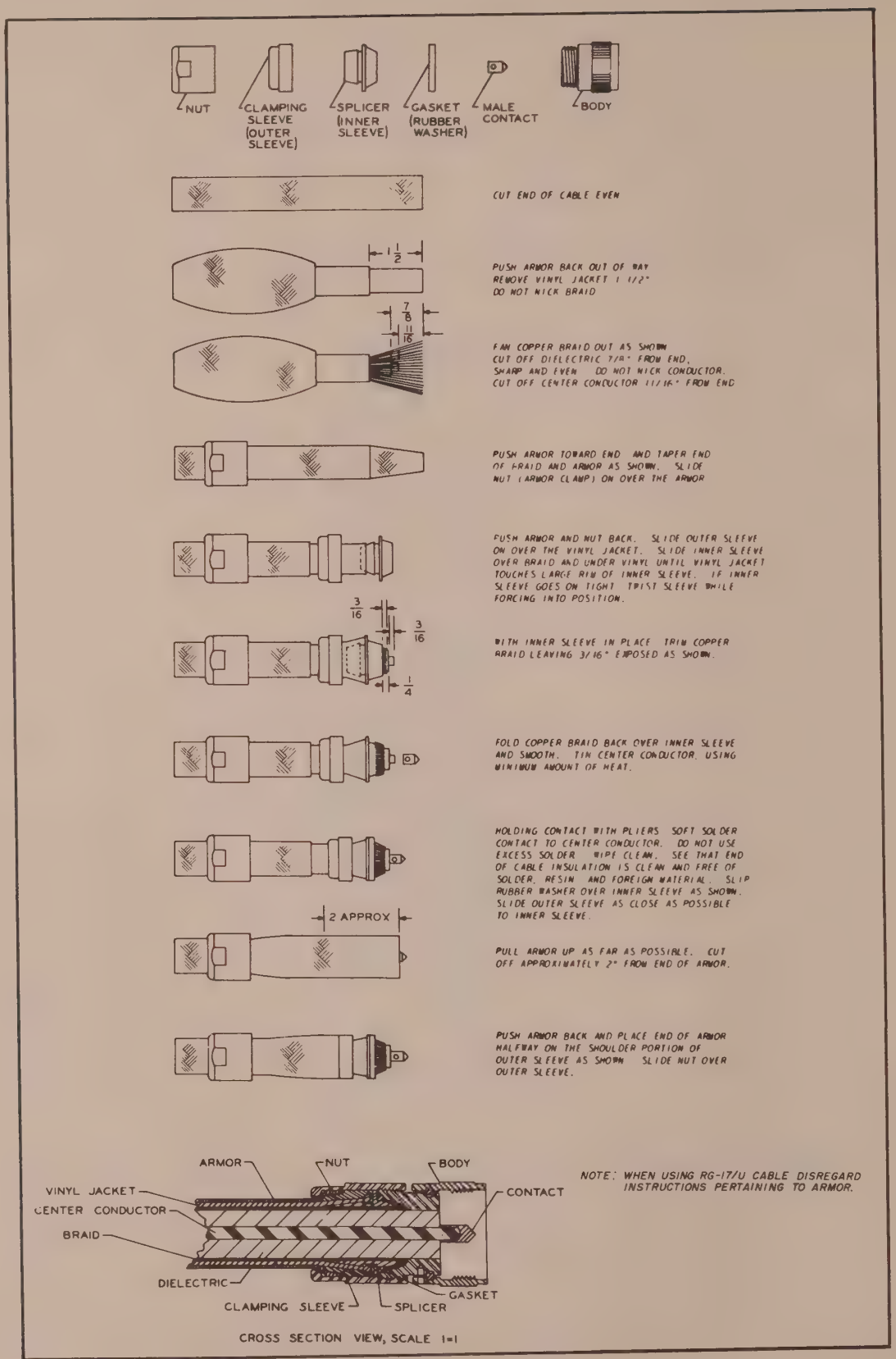


Figure 3-3. Cable Fabrication Details

rective procedures included in the maintenance section, Section 7.

b. MECHANICAL INSPECTION.—After completing the installation of the coupler groups, make a thorough inspection of the equipment and its associated wiring.

c. PRELIMINARY ADJUSTMENTS.—Perform preliminary adjustments as follows:

(1) TRANSMITTERS:—

(*a*) Turn transmitter off.

(*b*) Disconnect the transmitter output cable from the associated antenna coupler.

(*c*) Connect to this cable a 50-ohm, nonradiating, resistive load (Load Resistor DA-91/U) which is capable of dissipating the full output power of the transmitter (at least 500 watts).

(*d*) Start the transmitter and tune to the assigned frequency in the normal manner as described in the transmitter instruction manual.

(*e*) Turn the transmitter off.

(*f*) Transfer the 50-ohm resistive load in turn to each of the other transmitter output receptacles as in step (*b*) above and repeat steps (*a*) through (*e*).

(*g*) Reconnect the output cable from each transmitter to its associated antenna coupler.

(2) ANTENNA COUPLERS.—Adjust the antenna couplers as follows:

(*a*) Turn all the transmitters off.

(*b*) Disconnect the antenna transmission line from the OUTPUT jack, located on the right hand side of the cabinet.

(*c*) Connect the 50-ohm resistive load to the output jack. This will require fabrication of a test cable as follows: to one end of a short length (about 6 feet) of RG-17/U cable attach a UG-982/U connector. To the other end of this cable attach a UG-154/U connector. Connect this fitting to the output jack and connect the UG-982/U fitting to the DA-91/U resistive load.

(*d*) Make sure that the transmitter operating at the highest frequency is connected to COUPLER NO. 1 (see figure 3–1). The transmitter operating on the next to the highest frequency should be connected to COUPLER NO. 2, and so on.

(*e*) Adjust the TUNING control on each antenna coupler so that the associated mechanical counter is set in accordance with the typical calibration curves shown in figure 3–4 for the desired operating frequency.

(*f*) Adjust the COUPLING control on each antenna coupler so that the associated mechanical counter is set in accordance with the settings indicated on figure 3–5 for the desired operating frequency.

(*g*) Set the SENSITIVITY HIGH-LOW switch to LOW.

(*h*) Apply power to the blower assembly.

CAUTION

BLOWER VOLTAGE indicator lamp I202 should light and the blower motor should operate, otherwise excessive heat may damage the antenna coupler.

(*i*) Energize the transmitter connected to COUPLER NO. 4 and close the transmitter test key.

(*j*) Adjust the TUNING and COUPLING controls for a minimum indication on the MATCH INDICATOR.

(*k*) Set SENSITIVITY HIGH-LOW switch to HIGH and readjust TUNING and COUPLING controls for minimum indication on the MATCH INDICATOR.

(*l*) Open the test key and turn the transmitter off.

(*m*) Repeat steps (*e*) through (*l*) for the remaining antenna couplers.

(*n*) Remove the 50-ohm load from the OUTPUT jack and reconnect the antenna transmission line.

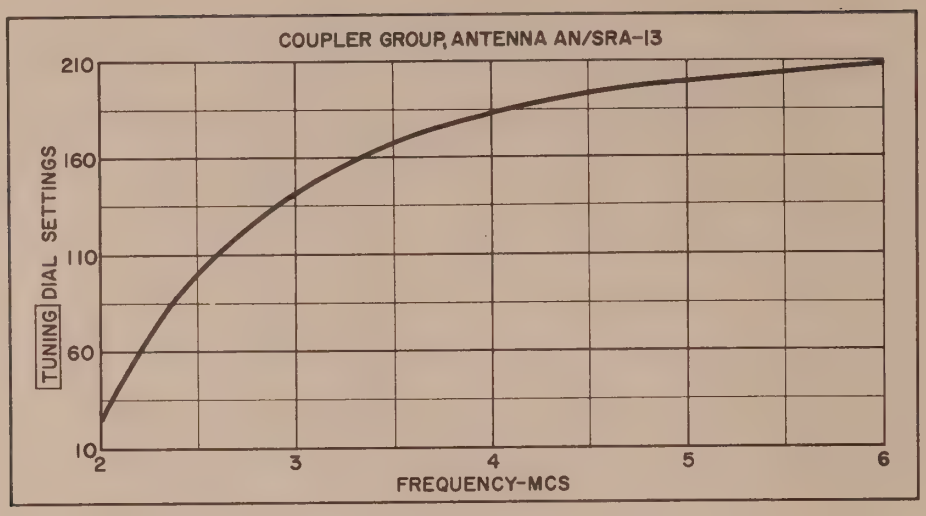
(*o*) Energize one transmitter and close the test key.

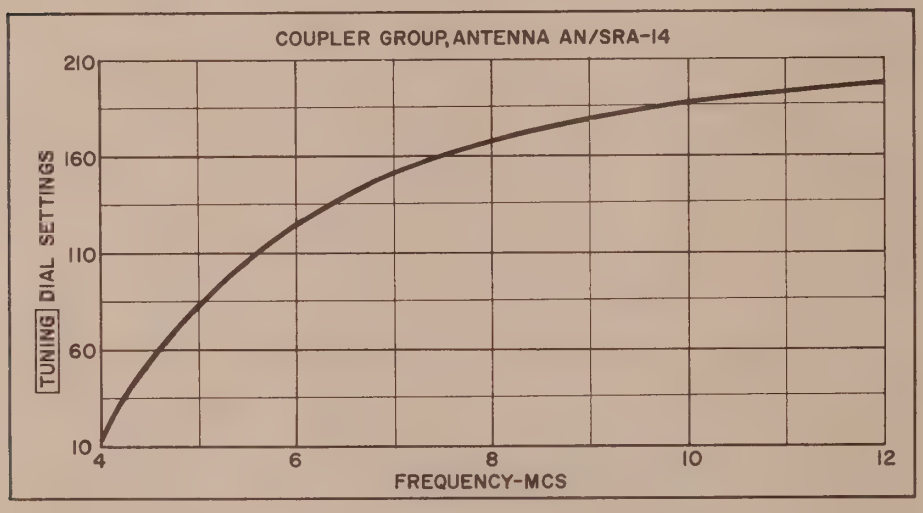
(*p*) The MATCH INDICATOR should indicate approximately zero. If it does not, the TUNING and COUPLING controls should be readjusted slightly until a minimum indication is obtained.

(*q*) Open the test key, and turn this transmitter off.

(*r*) Repeat steps (*o*) through (*q*) for the remaining antenna couplers.

(*s*) When each antenna coupler is finally adjusted, note the settings of the TUNING and COUPLING controls and record them on the calibration chart on the front panel of each antenna coupler.





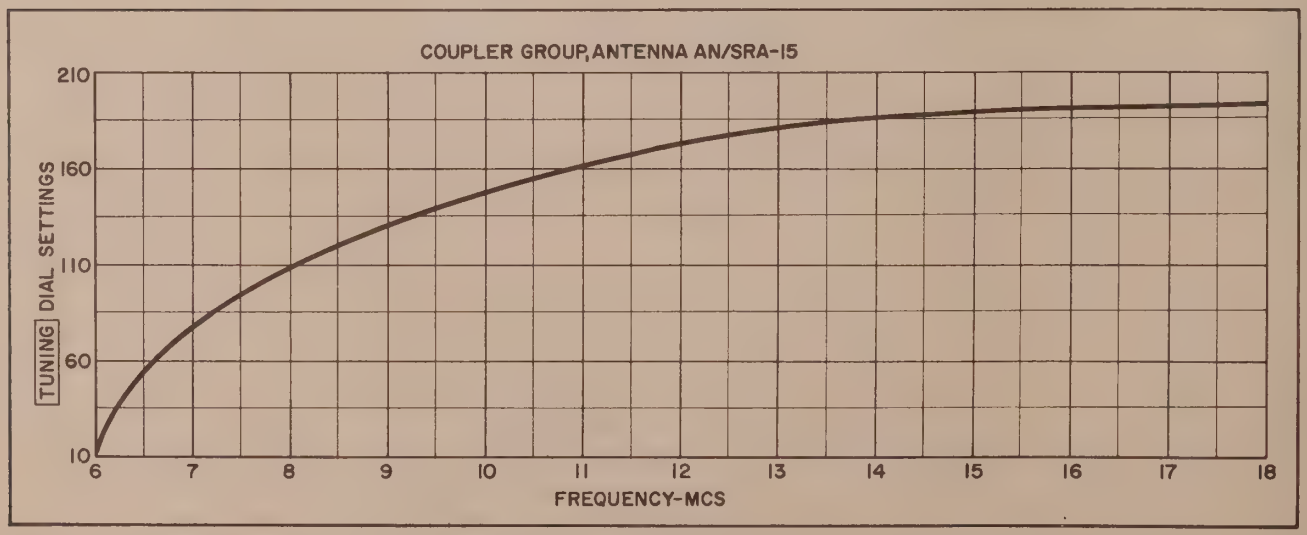
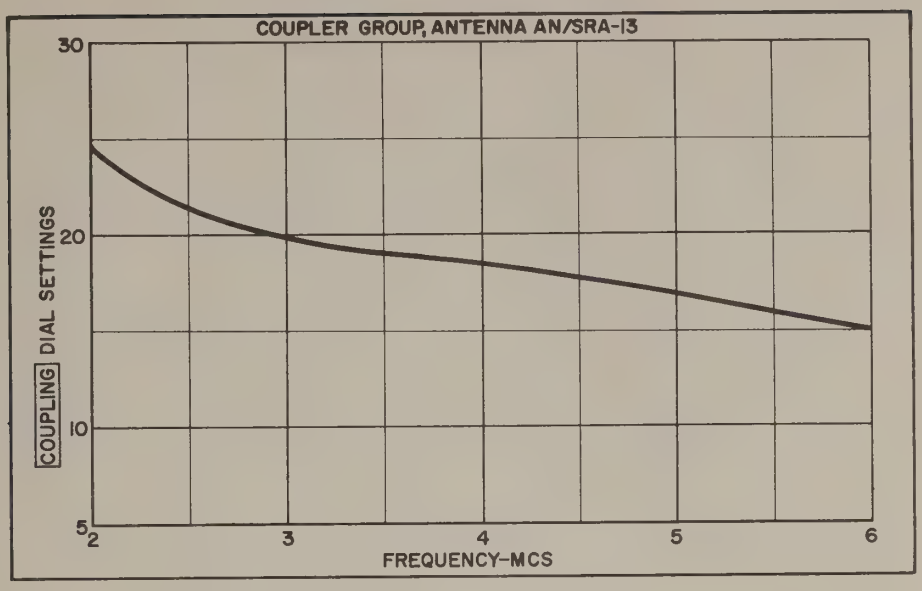
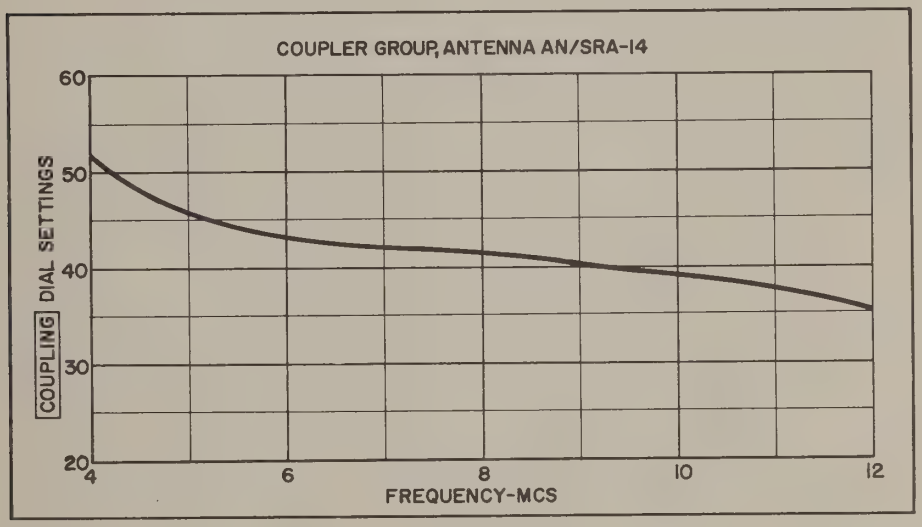


Figure 3-4. Coupler Group, Antenna AN/SRA-13; Coupler Group, Antenna AN/SRA-14, and Coupler Group, Antenna AN/SRA-15, Typical TUNING Dial Settings





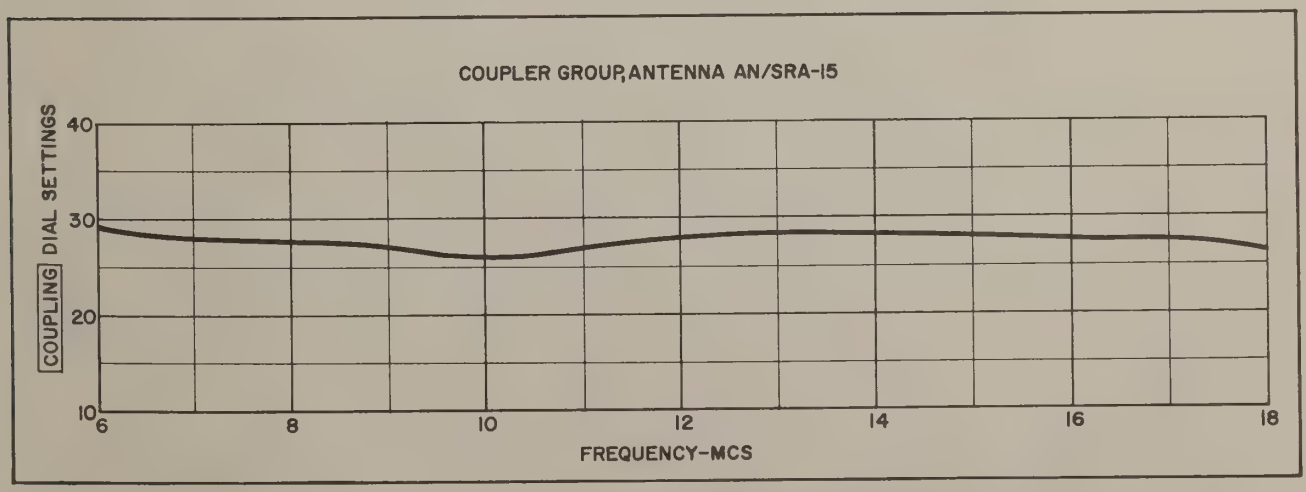


Figure 3-5. Coupler Group, Antenna AN/SRA-13; Coupler Group, Antenna AN/SRA-14, and Coupler Group, Antenna AN/SRA-15, Typical COUPLING Dial Settings

SECTION 4
OPERATION

1. INTRODUCTION.

a. GENERAL.—Coupler Groups, Antenna AN/SRA-13, AN/SRA-14, and AN/SRA-15 are each designed to permit the operation of four transmitters into a single broadband antenna. Each of the three coupler groups must be operated independently with a broadband antenna designed to produce a voltage standing wave ratio no greater than 3 to 1 over its frequency range at the output terminal of the coupler group.

b. OPERATING CONTROLS AND INDICATORS.—All operating controls and indicators are located on the front panels of the equipment. No internal adjustments or settings should be attempted by the operator. The various front-panel controls and indicators are listed in table 4–1 and are shown in figure 4–1.

TABLE 4-1. CONTROL LOCATION AND FUNCTION

Illustration Reference No.	Functional Designation	Location	Letter Designation	Type of Component	Symbol	Purpose of Control
4-1	BLOWER VOLTAGE	Panel, Fuse SB-406/SRA	1	Indicator lamp	I201	Lights when blower motor is operating.
4-1	TUNING	Coupler, Antenna CU-419/SRA-13	2	Capacitor	C3 and C1	Tune input and tank circuit to desired operating frequency.
		Coupler, Antenna CU-420/SRA-14	2	Capacitor	C4 and C3	
		Coupler, Antenna CU-421/SRA-15	2	Capacitor	C4 and C3	
4-1	COUPLING	All antenna couplers	3	One-turn loop	L2	Adjust output coupling between tank circuit and antenna transmission line.
4-1	MATCH INDICATOR	All antenna couplers	4	Microammeter	M1	Indicates degree of impedance mismatch.
4-1	LOCK	All antenna couplers	5	Knob	O40	Locks either TUNING or COUPLING controls.
4-1	MECHANICAL DIAL	All antenna couplers	6	Mechanical dial	M2	Indicates the setting of the TUNING and COUPLING controls.
4-1	SENSITIVITY HIGH-LOW	All antenna couplers	7	Toggle switch	S1	Controls sensitivity of match indicator circuit.

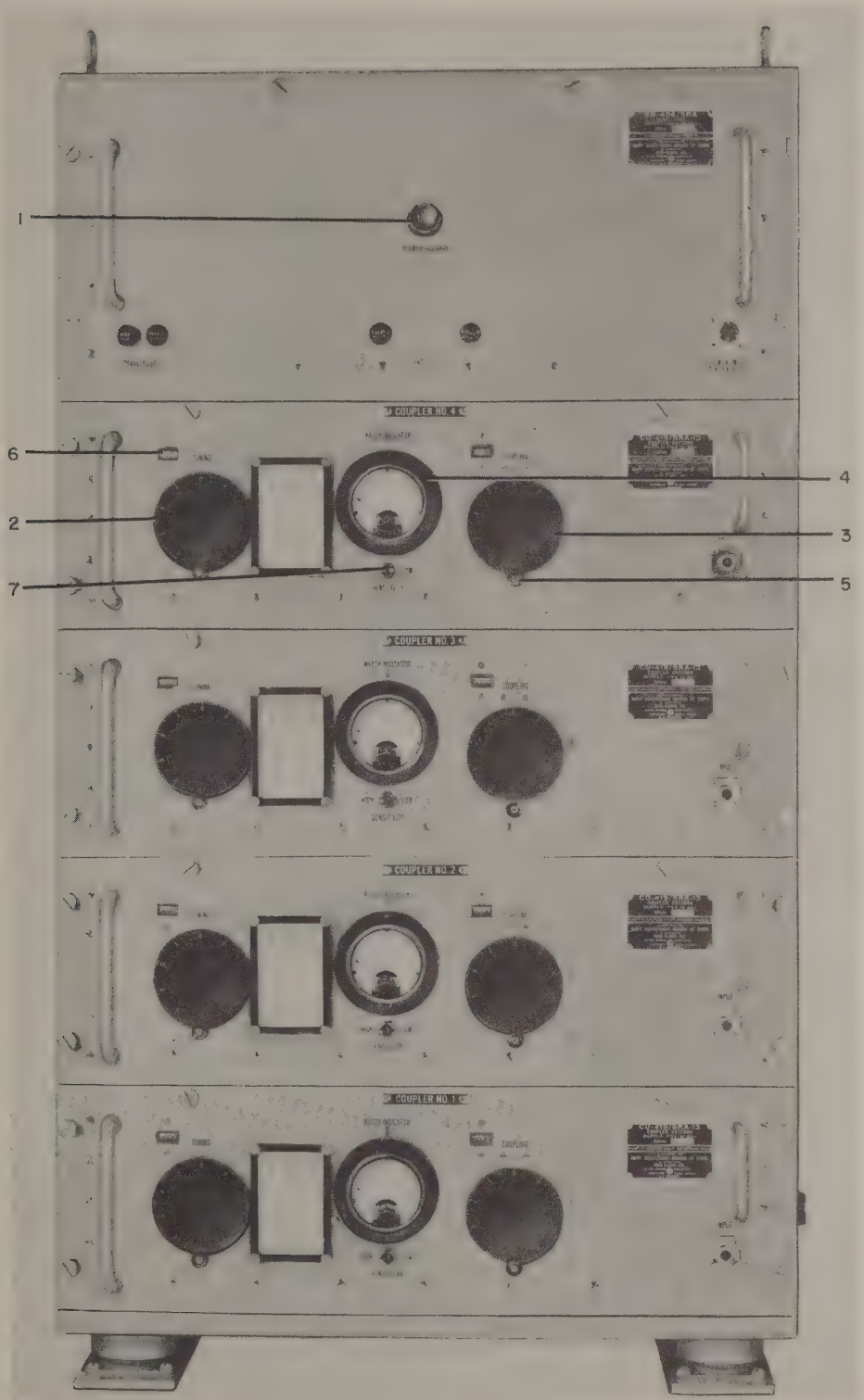


Figure 4-1. Location of Controls

(1) PANEL, FUSE SB-406/SRA.—The fuse panel contains an indicator lamp, designated Blower Voltage, which lights when primary power is applied to the blower motor.

(2) ANTENNA COUPLER.—The following controls and indicators are located on the front panel of the antenna coupler.

(*a*) TUNING.—This is a knob type control which gang tunes a variable air-dielectric capacitor and a vacuum-type capacitor. It tunes the input impedance-matching circuit to match the 50-ohm impedance of the transmission line from the transmitter.

(*b*) COUPLING.—This is a knob type control which adjusts a coupling loop. It controls the amount of coupling between the tank circuit and the antenna transmission line.

(*c*) MATCH INDICATOR.—This is a microammeter which indicates the degree of impedance mismatch between antenna transmission line and the r-f feed line from the transmitter.

(*d*) DIAL LOCK.—Two knobs located directly under the TUNING and COUPLING controls, provide for locking these controls. Turning the knob clockwise locks and turning the knob counterclockwise unlocks the associated controls.

(*e*) MECHANICAL COUNTER.—Mechanical counters indicate the setting of the TUNING control and of the COUPLING control.

(*f*) SENSITIVITY HIGH-LOW.—This is a two-position toggle switch which controls the sensitivity of the match indicator circuit. In HIGH position it affords maximum sensitivity, and in LOW position minimum sensitivity.

2. OPERATING PROCEDURE.

a. PRELIMINARY.—Before energizing the equipment, proceed as follows:

(1) Check all cable connections.

(2) Check to see that the coupler groups are set to the correct operating frequency.

b. STARTING.—Proceed as follows:

(1) Apply primary power to the coupler group to be operated.

CAUTION

If the BLOWER VOLTAGE indicator lamp does not light and the blower motor does not operate, check the power connector for tightness or check the panel fuses for continuity. If the lamp still does not light, remove primary power and report this condition to the proper authority.

(2) Set the associated transmitters in operation as described in their instruction manuals.

(3) Check to see that the MATCH INDICATOR on each coupler indicates a minimum value. If necessary, readjust the TUNING and COUPLING controls slightly.

c. STOPPING.—Proceed as follows:

(1) Stop the transmitttrs by pressing the stop button on their front panel.

(2) Remove primary power from the coupler group to be taken out of service.

3. FREQUENCY ALLOCATION.

Two suggested plans for frequency allocation are discussed in the following paragraphs. The equipment should be operated only on authorized frequencies within these band allocations.

a. FREQUENCY ALLOCATION FOR ONE COUPLER GROUP.—The following frequency allocation plan may be used when operating one coupler group. To obtain optimum efficiency in transfer of power from the antenna coupler to the antenna (refer to Section 1, paragraph 7*n*) and voltage isolation ratio between adjacent channels (refer to Section 1, paragraph 7*o*), the highest frequency is assigned to COUPLER NO. 1 and the lowest frequency is assigned to COUPLER NO. 4. Table 4–2 lists the frequency bands allocated to the four antenna couplers in a coupler group.

TABLE 4-2. TYPICAL FREQUENCY BANDS ALLOCATED FOR ONE COUPLER GROUP

Coupler No.	Coupler Group, Antenna AN/SRA-13 (2 — 6 mc)	Coupler Group, Antenna AN/SRA-14 (4 — 12 mc)	Coupler Group, Antenna AN/SRA-15 (6 — 18 mc)
1	5.2 to 6.0 mc	10.3 to 12.0 mc	15.9 to 18.0 mc
2	4.1 to 4.7 mc	8.2 to 9.6 mc	12.3 to 14.4 mc
3	3.0 to 3.7 mc	6.0 to 7.4 mc	9.0 to 11.1 mc
4	2.0 to 2.7 mc	4.0 to 5.4 mc	6.0 to 8.1 mc

The high end of the band of any one antenna coupler is separated by 10 percent from the low end of the next higher frequency band. This 10 percent frequency separation allows each antenna coupler considerable flexibility for shifting frequencies within its own frequency band without interfering with an adjacent channel. Any unused frequencies between bands can be used, as long as the frequency separation between adjacent channels is not less than 10 percent.

b. FREQUENCY ALLOCATION FOR MORE THAN ONE COUPLER GROUP.—The following frequency allocation plan may be used when two or more coupler groups are operating simultaneously, and it is desired to cover a specified frequency range. This plan allows a limited frequency variation between transmitters and utilizes the overlapping frequency ranges of the coupler groups. It is possible to assign channels to an antenna coupler of one coupler group such that the spacing is only 2 percent from a channel allocated to an antenna coupler of a different coupler group. There is a 10 percent separation in frequency between COUPLER NO. 1 and COUPLER NO. 2, COUPLER NO. 2 and COUPLER NO. 3, COUPLER NO. 3 and COUPLER NO. 4. In this manner, as listed in table 4–3, 13 frequency bands may be allocated between 4 and 13 megacycles.

TABLE 4-3. TYPICAL FREQUENCY BANDS ALLOCATED BETWEEN 4 AND 13 MEGACYCLES

Coupler No.	Coupler Group, Antenna AN/SRA-13 (2 — 6 mc)	Coupler Group, Antenna AN/SRA-14 (4 — 12 mc)	Coupler Group, Antenna AN/SRA-15 (6 — 18 mc)
1		11.5 to 12.0 mc	12.2 to 12.7 mc
2		9.2 to 9.7 mc	9.9 to 10.4 mc
3		7.1 to 7.6 mc	7.8 to 8.3 mc
4	4.0 to 5.0 mc	5.2 to 5.7 mc	5.9 to 6.4 mc

The final plan for allocation of frequencies in a specific installation must be based upon actual conditions peculiar to the installation and upon operation of the equipment.

4. CHANGING FREQUENCY.

The frequency allocations indicated in paragraph 3 above are sufficiently separated to permit the transmitters to operate into a coupler group without interchannel interference. Caution must be exercised when shifting frequencies within a system because a condition where two antenna couplers are tuned momentarily to the same frequency will cause overloading of the power-amplifier tubes in the transmitters. If overloading of the transmitter did not occur, the antenna coupler being tuned would absorb a considerable portion of the energy from the operating transmitter, causing a momentary decrease in the strength of the transmitted signal. Caution must be exercised if it is proposed to operate both receivers and transmitters on the same coupler group. In such a case, it would be advisable to use a device which would disconnect the receiver from the coupler group when shifting the frequency of the receiver and its associated antenna coupler across or near the frequency in use by a transmitter.

SECTION 5

OPERATOR'S MAINTENANCE

1. INTRODUCTION.

To maintain peak performance of the equipment it will be necessary for the operator to perform routine checks when coming on watch and during each period when he is responsible for the operation of the equipment. Minor defects may develop during operation which may be easily rectified by the operator. Correction of these minor troubles will prevent the occurrence of major troubles at a later date. The operator should be sufficiently familiar with the technical details of the equipment to correct minor defects that may develop when trained technical aid is not available.

2. OPERATOR'S CHECK CHART.

The following check chart and service information is offered for the guidance of the operator.

3. REPLACEMENT OF FUSES.

The front of Fuse Panel SB-406/SRA contains the four fuses for each coupler group. Two fuses are active and two fuses are spares. Table 5–2 lists the symptoms of fuse failure and other data relating to fuses.

TABLE 5-1. OPERATOR'S CHECK CHART—EACH WATCH, OR HOURLY

What to Check	How to Check	Precautions
Information from previous operator.	Review history in log-book. Receive verbal instructions.	Verify reported abnormal operation during your watch.
Antenna coupler tuning.	Observe meter indication. Make minor adjustments of tuning controls to verify proper tuning.	Be familiar with tuning procedure.
Operating frequency of transmitter.	Use frequency meter or other stable frequency monitoring device.	Frequencies must not drift.
Indicator lamp.	Observe indicator lamp.	Unlit indicator lamp may be indicative of inoperative blower motor.

TABLE 5-2. FUSES

Symptom	Fuse	Location	Protects	Amps	Volts
Indicator lamp I201 does not light.	F-201 F-202	Panel, Fuse SB-406/SRA	Blower circuit.	3 3	250 250

SECTION 6

PREVENTIVE MAINTENANCE

1. INTRODUCTION.

The maintenance of these coupler groups does not begin when equipment fails to operate in a normal manner. Maintenance must begin weeks, even months before, when equipment is first installed. Regular care and inspection, known as preventive maintenance, are just as important as corrective maintenance. Hence, if a regular schedule of preventive maintenance is adhered to, most of the common faults and breakdowns will never occur. Only a few minutes each day are needed to assure that the equipment is kept free from dirt, dust, corrosion and other foreign matter; that all cables and plugs of the equipment are clean and tight-fitting; and that no part of the equipment is being abused or neglected.

It is extremely important that personnel become very familiar with normal operating conditions so that abnormal conditions can be quickly detected. The equipment should be carefully studied during operation to locate all detectable symptoms of trouble. Valuable time can be saved by a careful analysis of the situation and formulation of several possible theories about the trouble. This approach is preferable to waiting for the trouble to become so serious that it causes a shut-down, even though the source of the difficulty may be, by then, quite obvious.

2. MAINTENANCE SCHEDULE.

An outline of the important items to be inspected is given in table 6–1.

TABLE 6-1. MAINTENANCE SCHEDULE

	What to Check	How to Check	Precautions and Remedies
Hourly	Antenna coupler tuning.	Observe meter indication. Make minor adjustments of tuning controls to verify proper tuning.	Be familiar with tuning procedure.
	Indicator lamp.	Observe indicator lamp.	Unlit indicator lamp may be indicative of inoperative blower motor, open fuse, or faulty indicator lamp.
Daily	Coils, capacitors, etc.	Visually and manually inspect all parts in antenna coupler for overheating and damage.	Remedy any signs of breakdown, overheating, or breakage, by repairing or replacing part.
	Zero-setting of microammeter.	With antenna coupler not operating, meter should indicate zero.	Erroneous readings will result if meter is not zeroed. Small setscrew below glass allows adjustment.
	Accumulation of dust or dirt and corrosion.	Note deposits of dust, dirt, or corrosion in various units.	Remove by approved method.
	Blower motor.	Feel motor for overheating.	Check operation of blower motor.
Weekly	Connectors, receptacles, etc.	Check connectors, receptacles, and cables for looseness, wear and damage.	Tighten connector and repair cables when necessary.
	Air filters.	Inspect each filter for excessive accumulation of dust or dirt.	Clean or replace as necessary.

TABLE 6-1. MAINTENANCE SCHEDULE—Continued

	What to Check	How to Check	Precautions and Remedies
Monthly	Tuning shafts and gears.	Rotate each control to maximum and minimum settings, and note any binding, looseness, or other abnormal conditions.	Apply lubricant when necessary. Refer to lubrication instructions, paragraph 4.
	All nut, bolt, and screw connections.	Carefully check for corrosion, looseness or poor contacts.	Use crocus cloth or #0000 sandpaper for cleaning.
Annually	Coupler group overhaul.	Thoroughly clean all components avoiding disassembly wherever possible. Relubricate gears. Replace parts where necessary.	Experienced technician should be present for any reassembly of replaced parts.

3. REMOVAL AND REPLACEMENT.

The removal and replacement procedure for antenna couplers and fuse panel is as follows.

a. ANTENNA COUPLERS.—All antenna couplers are removed in the same manner.

(1) REMOVAL.—Proceed as follows:

(*a*) Loosen the six captive thumbscrews on the front panel.

(*b*) Pull out the drawer assembly until it is stopped by the latch fastener. (The two latches are staggered to permit the drawer to be opened to various distances. The latch on the right allows the drawer to be opened approximately 1/3. The latch on the left allows the drawer to be opened about 2/3.)

(*c*) Lift the latch fasteners and pull out the drawer assembly.

Note

If the antenna coupler is to be removed for more than a brief period, a shorting-bar assembly, E3, with two banana plugs is provided for connecting through the 50-ohm r-f transmission line so service can be continued on the remaining antenna couplers.

(2) REPLACEMENT.—Proceed in the reverse order of removal.

b. PANEL, FUSE SB-406/SRA.—All fuse panels are removed in the same manner.

(1) REMOVAL.—Proceed as follows:

(*a*) Remove the primary power.

(*b*) Loosen the six captive thumbscrews on the front panel.

(*c*) Pull out the drawer assembly until it is stopped by the latch fastener.

(*d*) Disconnect the red and green wires connected from terminals 1 and 4 of terminal board TB301 at the fuse panel.

(*e*) Lift the latch fasteners and pull out the drawer assembly.

(2) REPLACEMENT.—Proceed in the reverse order of removal.

4. LUBRICATION.

The tuning mechanisms are fitted with sealed bearings requiring no lubrication. The open gears should be lubricated periodically by a light application of universal gear lubricant MIL-L-2105, Grade 75. The bushings of the dial counters and dial shafts should be lubricated with instrument oil MIL-L-6085.

SECTION 7

CORRECTIVE MAINTENANCE

1. INTRODUCTION.

In the normal service life of any piece of equipment, faults and breakdowns will develop. In order that necessary repairs may be made in a reasonably short time, a logical testing routine must be followed. The two-fold purpose of any corrective maintenance procedure is first, the localization of the faulty unit, and second, locating the faulty stage or component. The cause of the trouble must be determined as quickly and accurately as possible. The maintenance technician should familiarize himself with the operating and unit make-up of the equipment prior to the occurrence of trouble. Schematic diagrams, figures 7–12 through 7–15, should be referred to frequently as an aid to servicing.

When repairs are necessary it is recommended that the servicing be done, whenever possible, by competent radio technicians, supplied with suitable tools and test equipment.

When working on the equipment remember that 115 volts, and that high r-f power may be present. Use extreme caution.

Before proceeding with any extensive repairs, be reasonably sure that performance of this repair will eliminate the trouble. Do not waste time in needless probing or replacement of parts. When trouble is encountered, be logical.

In all repairs and replacements, every attempt should be made to duplicate the original condition of the equipment. Standard replacement parts, such as taken from stock, should be used. Particular care should be taken to run any replacement wiring in the same position and manner as the original wiring. Soft soldering should be done with rosin-core solder. The smallest amount of solder necessary for a good mechanical and electrical joint should be used. Do not permit excess solder to drop on other components, or remain within the chassis.

In the event of emergency repairs, where it is impossible to make exact replacement of parts, the same care and workmanship must be taken. The temporarily repaired equipment should be conspicuously marked or tagged to indicate the temporary nature of the repair, and should be restored to its original condition at the first possible opportunity.

2. LOCALIZING OF TROUBLE.

In servicing the equipment, defective components causing inoperation should be localized as quickly and efficiently as possible. Each coupler group is divided into six major units. It is suggested that the following procedure be used in trouble shooting: Observe all meters for abnormal indications; observe indicator lamp on Panel, Fuse SB-406/SRA to determine if fuse panel is operative. Also, note any other visual or aural indications that may help isolate the stage at fault.

Check accessible components first. A defective circuit and its associated components should be checked systematically for continuity, defective resistors, shorted capacitors, loose connections, etc. Test equipment such as a volt-ohm-milliammeter with 20,000 ohms per volt sensitivity or better should be used for these tests.

When performing continuity checks or resistance measurements, take into account other components which may be in shunt with the part under test. For accurate results, disconnect one lead of the part being checked before proceeding with measurements.

3. SYSTEM TROUBLE SHOOTING.

System trouble shooting utilizes meters, switches, controls, etc. of a coupling group to isolate the fault to one of the units comprising the equipment. The unit trouble-shooting procedure given in paragraph 4 of this section is to isolate the fault within the unit to a particular circuit, stage, or component. In some cases, depending upon the circumstances, it may be quicker to replace the unit with one that is known to be in good working condition, if such a unit is available.

4. UNIT TROUBLE SHOOTING.

Unit trouble shooting requires detailed knowledge of the unit and may necessitate a review of the theory given in Section 2 for the particular unit. Some units depend upon mechanical devices for proper operation and repair of such items, such as the tuning and coupling systems, may be required to correct the trouble. A basic principle of trouble shooting is to proceed first with the simple and obvious, and then by orderly steps to the more complex and unusual troubles. The trouble-shooting chart in figure 7-2 presents information in a logical step-by-step fashion for the more common defects that may be encountered in the coupler group.

5. REMOVAL AND REPLACEMENT.

The removal and replacement procedures for components in the three couplers are as follows. See figure 7–5.

a. VACUUM-TYPE TUNING CAPACITOR.—These instructions describe the procedure for removal

FAILURE REPORTS

"Report each failure of the equipment, whether caused by a defective part, wear, improper operation, or an external cause. Use ELECTRONIC FAILURE REPORT form DD 787. Each pad of the forms includes full instructions for filling out the forms and forwarding them to the Bureau of Ships. However, the importance of providing complete information cannot be emphasized too much. Be sure that you include the model designation and serial number of the equipment (from the equipment nameplate), the type number of the major unit (from the major unit nameplate), and the type number and reference designation of the particular defective part (from the instruction book). Describe the cause of the failure completely, continuing on the back of the form if necessary. Do not substitute brevity for clarity. And remember—there are two sides to the failure report - - -

"YOUR SIDE"

Every FAILURE REPORT is a boost for you:

1. It shows that you are doing your job.
2. It helps make your job easier.
3. It insures available replacements.
4. It gives you a chance to pass your knowledge to every man on the team.

"BUREAU SIDE"

The Bureau of Ships uses the information to:

1. Evaluate present equipment.
2. Improve future equipment.
3. Order replacements for stock
4. Prepare field changes.
5. Publish maintenance data.

Always keep a supply of failure report forms on board. You can get them from the nearest District Publications and Printing Office."

Figure 7-1. Failure Report, Sample Form

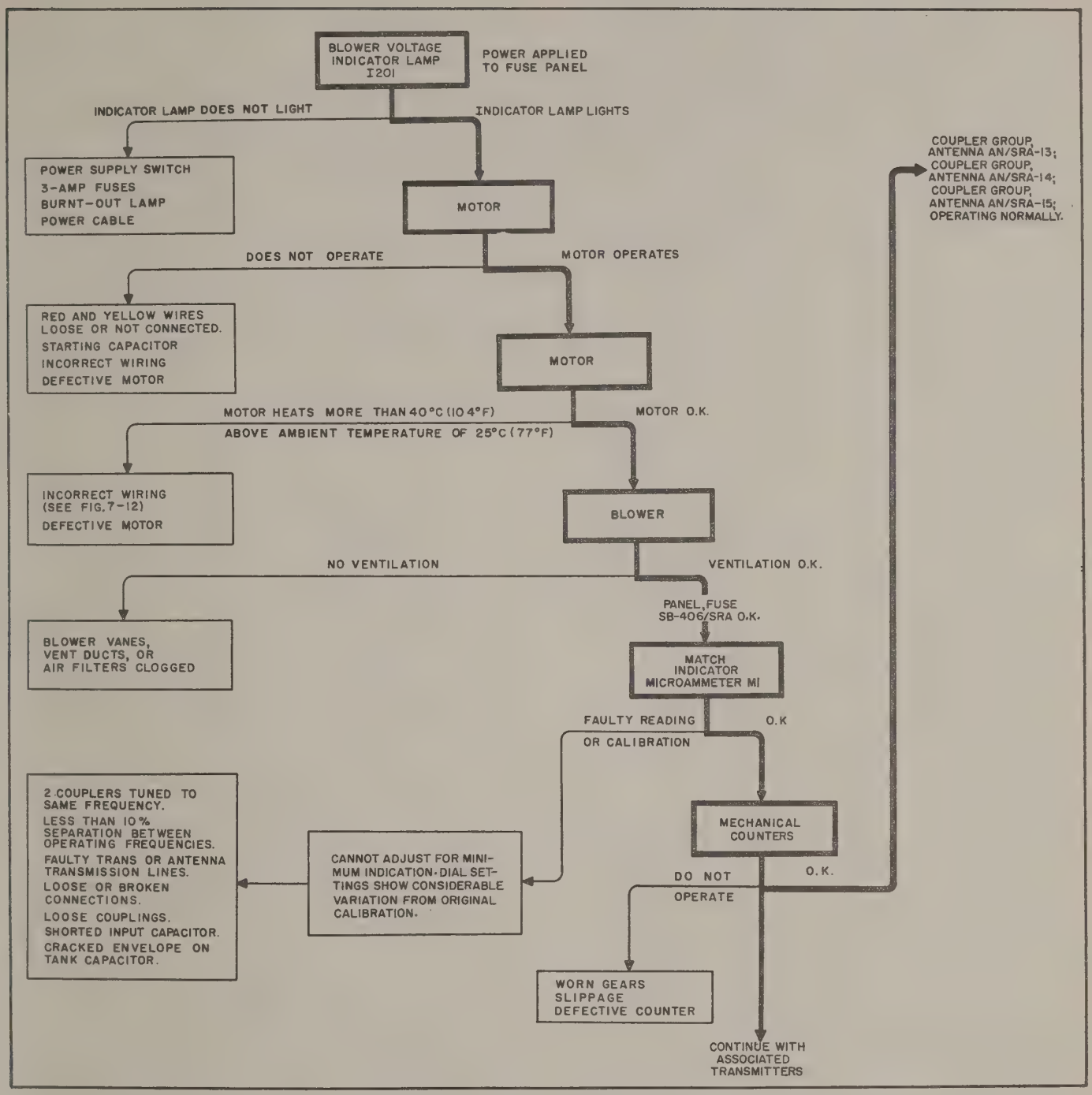


Figure 7-2. Fuse Panel and Antenna Coupler Trouble Shooting Chart

and replacement of the vacuum-type capacitors. The reference designations of the capacitors are given below.

NOMENCLATURE	REFERENCE DESIGNATION
AN/SRA-13	C1
AN/SRA-14	C3
AN/SRA-15	C3

(1) REMOVAL.—Proceed as follows:

(*a*) Set tuning dial and tuning mechanical counter to 0.

(*b*) Remove antenna coupler from cabinet as directed in Section 6, paragraph 3.

(*c*) Remove four screws and washers securing locking ring to gear train bracket.

(*d*) Remove lock nut and fastening nut on helical gear drive shaft, O-22 (see figure 7–5).

(*e*) Loosen the two setscrews nearest the vacuum capacitor on coupling O-18.

(*f*) Remove bearing in gear train bracket which

holds helical gear drive shaft O-22 in position by tapping bearing on the inside.

(*g*) Remove the two No. 6-32 x 1/2 inch screws and lock washers holding clamp O-44 to electrical clamp O-43.

(*h*) Remove the four round-head No. 8-32 x 1/2 inch screws and lock washers holding bearing cap to the gear train bracket.

(*i*) Remove bearing cap.

(*j*) Lift vacuum capacitor, coupling O-18, helical gear O-20 and helical gear drive shaft O-22 slightly, and push coupling O-18 and helical gear and shaft away from capacitor.

(*k*) Lift out vacuum capacitor and remove bushing O-47 from thimble of vacuum capacitor.

(2) REPLACEMENT.—Proceed as follows:

(*a*) Obtain a replacement vacuum-type capacitor of the same type and capacity as the one removed. Check its dimensional tolerances, place the reducing fitting bushing O-47 on thimble, and see if vacuum-type capacitor fits properly into the cradle of the gear train bracket.

(*b*) Mesh plates of air dielectric capacitor.

(*c*) Set tuning dial and mechanical counter to 0.

(*d*) Place reducing fitting bushing O-47 on thimble of capacitor to be installed. (See figures 7–5, 7–6, and 7–7).

(*e*) Place vacuum capacitor with reducing fitting bushing O-47 in the cradle of the gear train bracket and slip coupling O-18 over the thimble end of the vacuum capacitor.

(*f*) Place bearing which supports helical gear shaft O-22 in gear train bracket.

(*g*) Insert the fastening and locking nuts on the helical gear shaft O-22, and tighten.

(*h*) Place locking ring in position on gear train bracket and insert the four screws and lock washers to secure locking ring to gear train bracket, and tighten.

(*i*) Tighten the two setscrews nearest the vacuum capacitor on coupling O-18.

(*j*) Place the bearing cap in position on the gear train bracket, and insert the four round-head No. 8-32 x 1/2 inch screws and lock washers and tighten.

(*k*) Rotate vacuum capacitor counterclockwise until rotating shank is freed slightly from base of capacitor on coupling O-18.

(*l*) Rotate vacuum capacitor clockwise one turn.

(*m*) Place clamp O-44 in position on electrical clamp O-43 and insert the two No. 6-32 x 1/2 inch screws and lock washers and tighten.

(*n*) Insert antenna coupler into cabinet as directed in Section 6, paragraph 3.

(*o*) Adjust the antenna coupler to its operating frequency as directed in Section 3, paragraph 5.

(*p*) If the indication on the mechanical counters differs from the setting on the calibrations chart (figure 3–4), refer to paragraph 6 of this section.

b. TUNING CONTROL MECHANICAL COUNTER.—Remove the mechanical counter as follows.

(1) REMOVAL.—Proceed as follows (see figure 7–5):

(*a*) Remove antenna coupler drawer assembly from cabinet (Section 6, paragraph 3*a*.).

(*b*) Turn the TUNING knob, associated with mechanical counter M2, so the dial registers 0 and all numerals on counter register 0. Lock the dial.

(*c*) Remove the two flat-head, No. 4-40 x 3/8 machine screws, hex nuts, and lock washers which fasten counter M2 to front panel of antenna coupler.

(*d*) Remove the four No. 4-40 x 1/8 setscrews from matched bevel gears O-38 and O-39, using No. 4 Allen wrench (two setscrews in each gear).

(*e*) Remove counter M2 by sliding shaft of counter out from bevel gear O-39 (36 teeth).

(*f*) Remove matched bevel gears O-38 and O-39.

(2) REPLACEMENT.—Proceed as follows:

(*a*) Slide bevel gear O-39 (36 teeth) on shaft of new counter M2, and fasten with the two No. 4-40 x 1/8 setscrews, using No. 4 Allen wrench.

(*b*) Mount new counter M2 on inside of front panel of antenna coupler, using the two flat-head, No. 4-40 x 3/8 machine screws, hex nuts, and lock washers.

(*c*) Turn new counter M2 so all numerals register 0 and hold counter at that registry. Also hold TUNING control knob, associated with M2, so that its dial registers 0.

(*d*) Place bevel gear O-38 (18 teeth) on the vertical shaft of the tuning control and fasten with the two No. 4-40 x 1/8 setscrews, using No. 4 Allen wrench.

(*e*) Replace the antenna coupler drawer assembly in the cabinet.

Note

Replace both bevel gears O-38 and O-39, if either is found worn or otherwise unusable, during the process of replacing counter M2. When doing so, be sure to use a new set of matched bevel gears O-38 and O-39. Use gear compound to enmesh gears if needed.

c. COUPLING CONTROL MECHANICAL COUNTER.—Remove the mechanical counter as follows:

(1) REMOVAL.—Proceed as follows (see figure 7–5).

(*a*) Remove antenna coupler drawer assembly from cabinet (Section 6, paragraph 3*a*).

(*b*) Turn the coupling control knob, associated with the mechanical counter M2, so the dial registers 0 and all numerals on the counter register 0. Lock the dial.

(*c*) Remove the two flat-head, No. 4-40 x 3/8 machine screws, hex nuts, and lock washers which fasten counter M2 to front panel of antenna coupler.

(*d*) Remove the four No. 4-40 x 1/8 setscrews from matched bevel gears O-17, using No. 4 Allen wrench (two setscrews in each gear).

(*e*) Remove counter M2 by sliding it out from bevel gears O-17.

(*f*) Remove the matched bevel gears O-17 (each gear has 18 teeth).

(2) REPLACEMENT.—Proceed as follows:

(*a*) Slide one bevel gear O-17 (18 teeth) on shaft of new counter M2 and fasten with the two No. 4-40 x 1/8 setscrews, using No. 4 Allen wrench.

(*b*) Mount new counter M2 on inside of front panel of antenna coupler, using the two flat-head, No. 4-40 x 3/8 machine screws, hex nuts, and lock washers.

(*c*) Turn new counter M2 so all numerals register 0 and hold counter at that registry. Also hold COUPLER control knob, associated with M2, so that its dial continues to register 0.

(*d*) Place second bevel gear O-17 (18 teeth) on the vertical shaft of the COUPLING control and fasten with the two No. 4-40 x 1/8 setscrews, using No. 4 Allen wrench.

(*e*) Replace the coupler drawer assembly in the cabinet.

Note

Replace both bevel gears O-17, if either is found worn or otherwise unusable, during the process of replacing counter M2. When doing so, be sure to use a new set of matched bevel gears O-17. Use gear compound to enmesh gears if needed.

d. RING INSULATORS E302 AND E303.—Remove ring insulators E302 and E303 as follows (see figure 7–11).

(1) REMOVAL.—Proceed as follows:

(*a*) Remove the five drawer assemblies from the cabinet (Section 6, paragraph 3). If feasible, dismount the cabinet from its usual location so cabinet can be tilted or laid on its back on the floor, thereby providing easier access to the parts which are to be replaced.

(*b*) Loosen eight contact blocks E301, which hold the output jacks, from their mountings O302 by removing the round-head 3/32 x 1 1/4 machine screw from each contact block E301 (figure 7–10). This will loosen one end of the two upper contact strips, E310 and E304 (figure 7–11) and one end of contact strip E309 leading to antenna receptacle J302.

(*c*) Loosen the three clamps holding radio frequency transmission line W301 by removing the three binding-head No. 4-40 x 1/4 machine screws and hex nuts. Then turn R-F transmission line W301 until the soldered ends of six contact strips E304 through E309 are just visible.

(*d*) Unsolder and remove six contact strips from center conductor of r-f transmission line.

(*e*) Remove the contact strip E310, which is a ground strap, at upper end of r-f transmission line W301 by removing two round head, No. 2 x 3/16 machine screws.

(*f*) Remove cover plate from top of cabinet and slide out r-f transmission line W301 and the center conductor.

(*g*) Withdraw center conductor from r-f transmission line W301 and remove five ring insulators E303 and one ring insulator E302.

(2) REPLACEMENT.

(*a*) Place new ring insulators E303 and E302 in r-f transmission line W301 and reinsert the center conductor rod. The ring insulators are made of lava and crumble very easily, therefore, handle carefully, preferably with gloves.

(*b*) Replace r-f transmission line W301 and the center conductor in the cabinet but do not tighten the clamps. Replace cover plate.

(*c*) Manipulate r-f transmission line W301 so as to align the contact strips E304 through E309 with contact blocks E301 and the serrations in center conductor. Then, soft solder the six contact strips E304 through E309 to serrations in center conductor.

(*d*) Refasten contact strip E310 at upper end of r-f transmission line W301 using two round-head No. 2 x 3/16 machine screws.

(*e*) Align upper two contact strips E304 to E310 with contact blocks E301 and refasten contact blocks E301 to their mountings using one round-head 8/32 x 1 1/4 machine screw for each block. At the same time refasten the loose end of the contact strip leading to antenna receptacle J302.

(*f*) Position r-f transmission line W301 and tighten the three clamps, using the three binding-head No. 4-40 x 1/4 machine screws and hex nuts.

(*g*) Remount the cabinet in its proper location and return the five drawer assemblies in the cabinet.

e. AIR-DIELECTRIC CAPACITORS, RADIO-FREQUENCY COILS, AND ASSOCIATED PARTS.—The removal and replacement of plate-meshing, air-dielectric capacitors, these being designated C1 for Coupler Group, Antenna AN/SRA-13, and C3 for Coupler Groups, Antenna AN/SRA-14, and AN/SRA-15, also radio-frequency coils L1 and L2, are usually unnecessary due to their rugged construction. Likewise, the replacement of associated parts, such as gears, shafts, couplings, etc., is usually not required as these are built of stainless steel or nickel-plated brass and have self-lubricated bearings on all of which very little wear is anticipated. If, however, due to battle damage or other reasons, such parts do require replacement, it is usually necessary to disassemble and rebuild the entire coupler unit. This involves the removal of the right-hand gusset (referred to the front of the drawer assembly), the removal of affected assemblies and subassemblies, the removal of the dowels or bolts by which they are fastened to the chassis, and the disconnection and/or the removal of coaxial cables, gears, shafts, couplings and other parts with which they are associated. It also involves the removal of setscrews in couplings so these can be slid back along their respective shafts. When reassembling the equipment, it is usually necessary to provide new shafts due to variance in tolerances of the new parts. Also gear compound must be used to properly enmesh any new gears that may be needed. Variations in tolerances of electrical parts, such as the thickness of silverplate on the r-f coils may affect the electrical characteristics of the coupler unit and require a complete retest

and recalibration of the unit. For extensive replacement of parts, a complete overhaul job is therefore recommended.

f. DIRECTIONAL COUPLER DC1 AND METER CASE ASSEMBLY.—The removal and replacement of parts in directional coupler DC1 and meter case assembly are obvious from examination of figures 7–8 and 7–9. To obtain access to parts in directional coupler DC1, remove cover plate by removing the eight round-head No. 4-40 x 1/4 machine screws and lock washers. To obtain access to the parts in the meter case assembly, remove case from rear of panel.

g. MISCELLANEOUS PARTS.—The location of miscellaneous replacement parts such as thumbscrews, blower motor B301, starting capacitor C301, etc., are shown on figures 7–3 through 7–10. The removal and replacement of such parts are obvious from examination of the equipment.

6. ADJUSTING VACUUM-TYPE CAPACITOR.

a. GENERAL.—The difference between the indication on the TUNING control mechanical counter for a specific frequency, and the setting taken from the TUNING control calibration chart (figure 3–4) for the same frequency indicates the correction (in revolutions) which must be made to the vacuum-type capacitor to return it to the correct calibration. One revolution of the TUNING control drive shaft O-55 (see figure 7–5) is equivalent to ten divisions on the TUNING control mechanical counter.

b. PROCEDURE.—If, for example, the indication on the TUNING control mechanical counter M2 is 20 divisions higher than the setting derived from the TUNING control calibration chart for the same frequency, proceed as follows:

(1) Remove the antenna coupler from the cabinet (Section 6, paragraph 3*a.*).

(2) Loosen the four screws securing the bearing cap to the gear-train bracket.

(3) Remove clamp O-44.

(4) Rotate the vacuum-type capacitor clockwise (referred to the shaft end) through two complete revolutions. Conversely, if the indication is 20 divisions lower than the correct setting, rotate the vacuum-type capacitor through two revolutions counterclockwise.

(5) Tighten the four screws on the bearing cap.

(6) Insert clamp O-44 on the end of the vacuum-type capacitor.

(7) Return the antenna coupler into the cabinet.

(8) Readjust the TUNING control for a minimum indication on MATCH INDICATOR microammeter M1.

(9) Repeat the above procedure if the TUNING control mechanical counter does not agree with the indication taken from the TUNING control calibration chart.

TABLE 7-1. WINDING DATA

Designation Symbol	Part No.	Diagram	Winding	Wire Size	Turns	D-C Resistance in Ohms	Impedance Ratio	Remarks
Coupler, Antenna CU-419/SRA-13								
L1	N16-C-71752-3563		Single	0.128 D 4 3/8 ID 5 1/8 OD 8.0 lg	11	Less than 1		
L2	N16-C-71581-2993		Single	0.062 thk 4.0 ID 1/2 Wide	1	Less than 1		
Coupler, Antenna CU-420/SRA-14								
L1	N16-C-71581-4370	Same as L1 of CU-419/SRA/13	Single	0.187 D 3-1/16 ID 3-7/16 OD 7.0 lg	11	Less than 1		
L2	N16-C-71581-2718	Same as L2 of CU-419/SRA/13	Single	0.962 thk 0.5 Wide 2.687 ID	1	Less than 1		
Coupler, Antenna CU-421/SRA-15								
L1	N16-C-71581-3269	Same as L1 of Coupler CU-419/SRA-13	Single	0.187 D 3-1/16 ID 3-7/16 OD 7.0 lg	6	Less than 1		

TABLE 7-1. WINDING DATA—Continued

Designation Symbol	Part No.	Diagram	Winding	Wire Size	Turns	D-C Resistance in Ohms	Impedance Ratio	Remarks
L2	N16-C-71581-2718	Same as L2 of Coupler CU-419/SRA-13	Single	0.062 thk 0.5 Wide 2.687 ID	1	Less than 1		

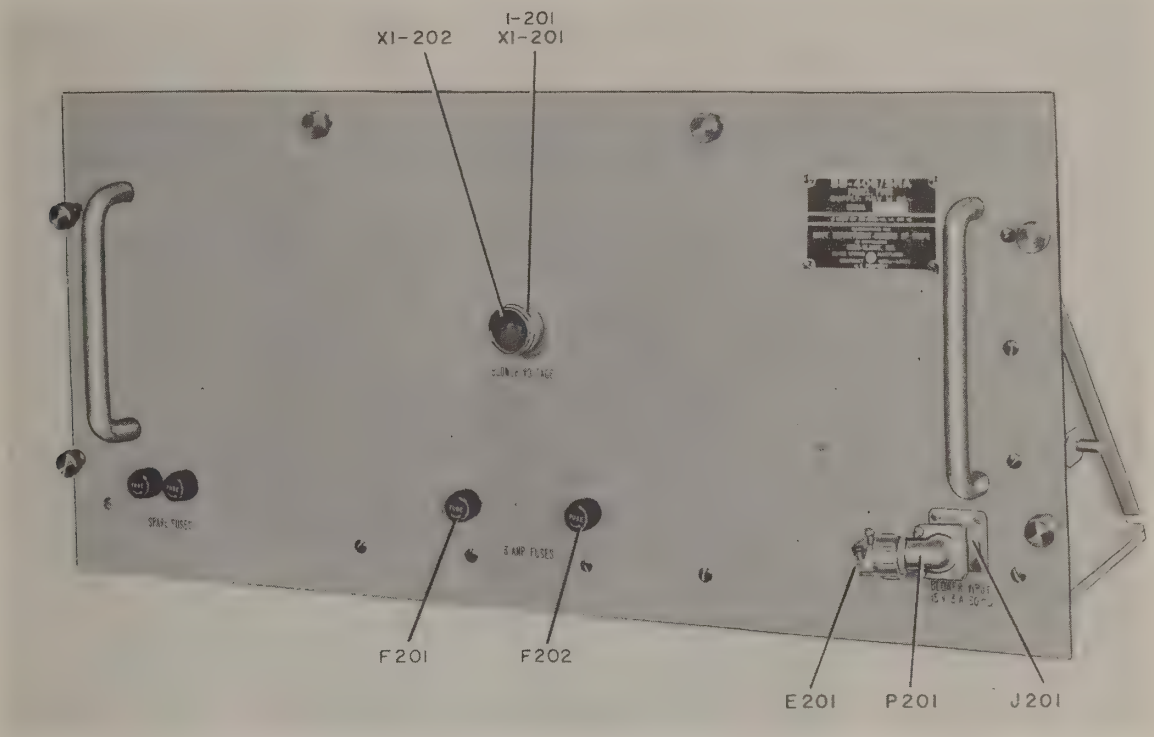


Figure 7-3. Panel, Fuse SB-406/SRA, Front View, Location of Parts

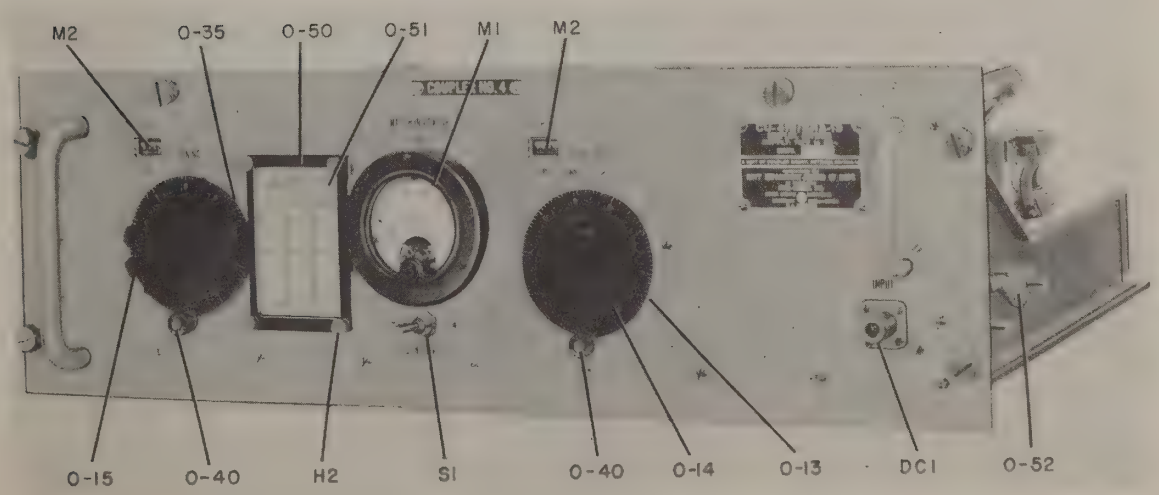


Figure 7-4. Coupler, Antenna CU-419/SRA-13, Front Oblique View, Location of Parts

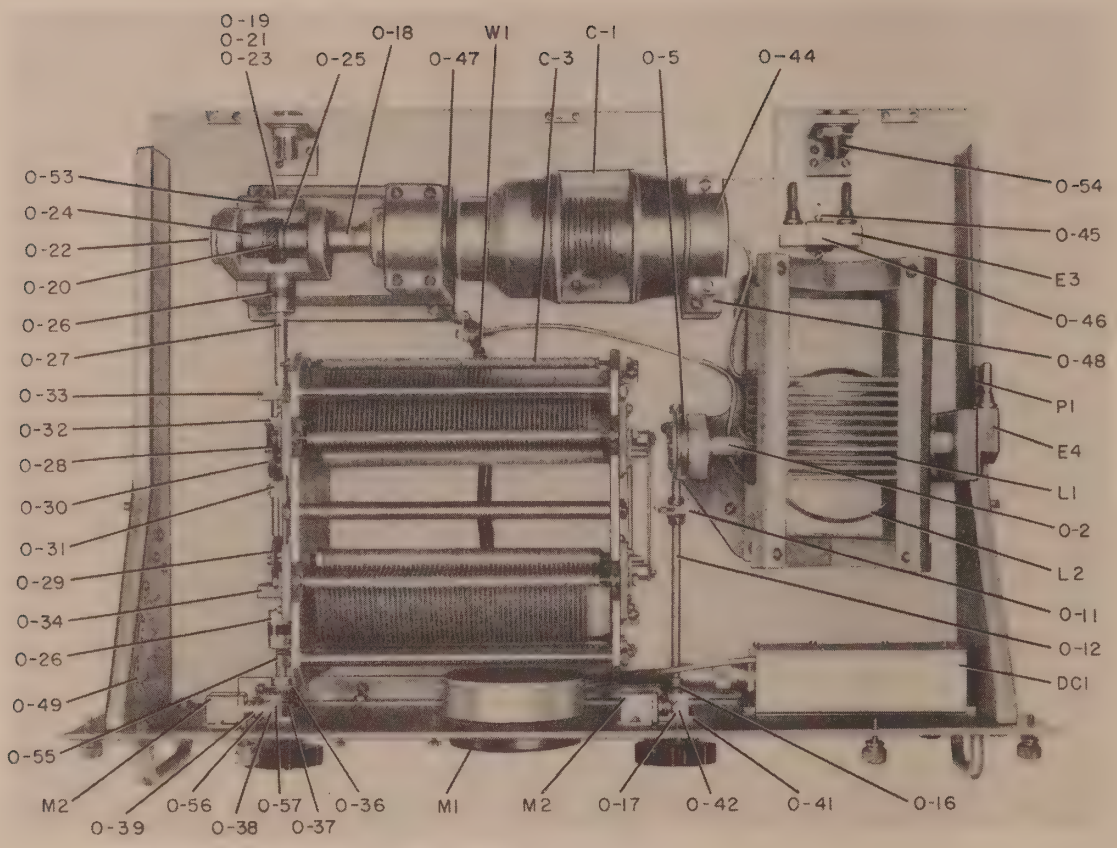


Figure 7-5. Coupler, Antenna CU-419/SRA-13, Top View, Location of Parts

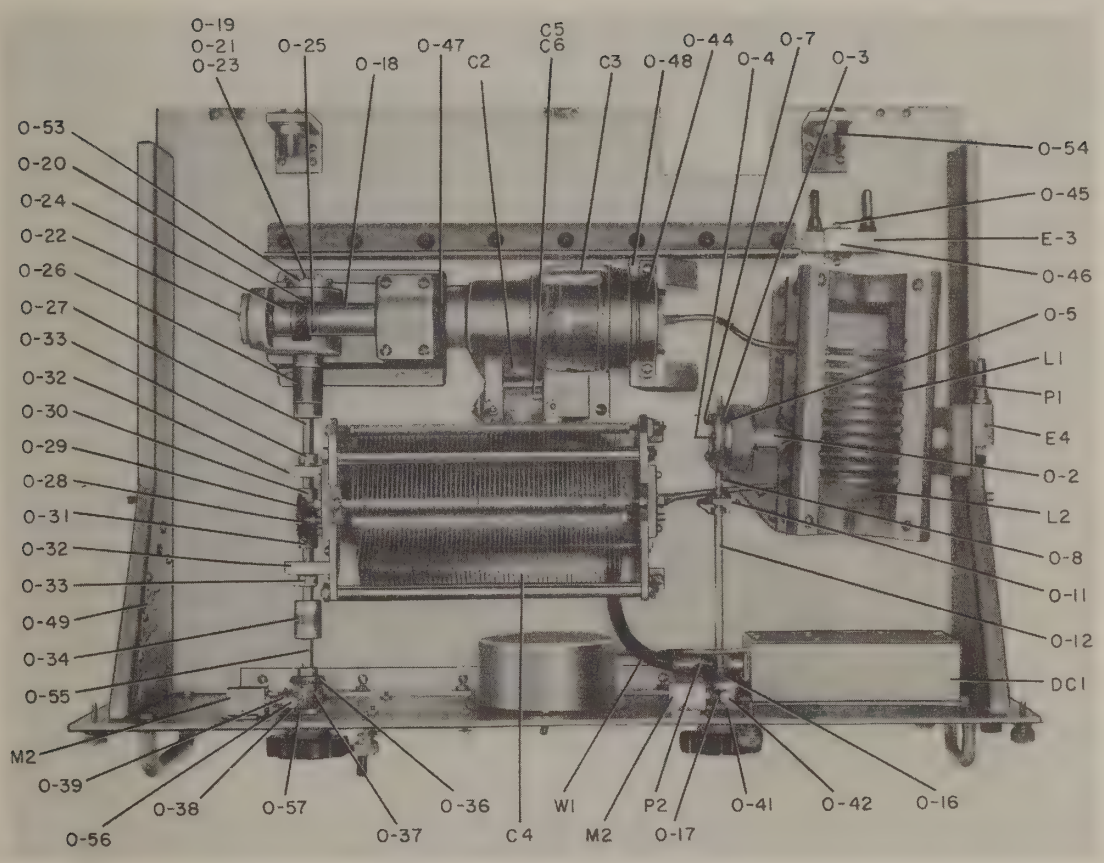


Figure 7-6. Coupler, Antenna CU-420/SRA-14, Top View, Location of Parts

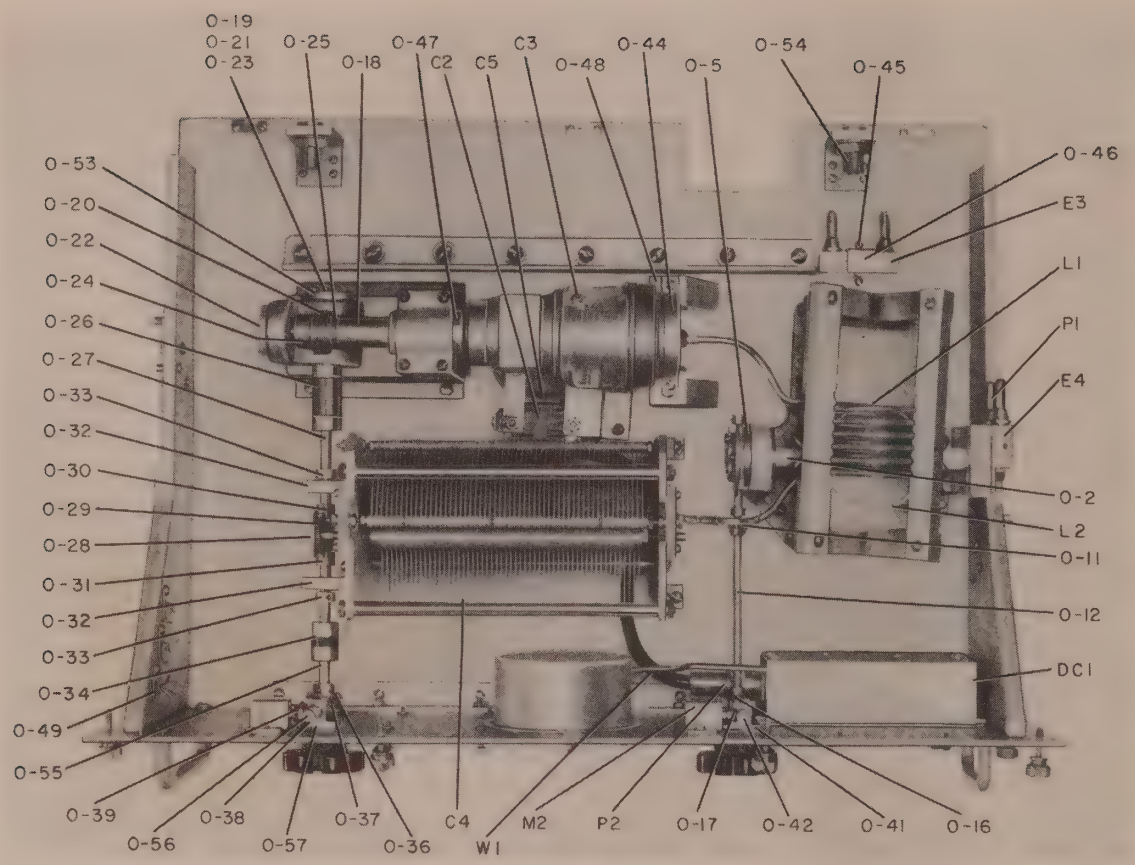


Figure 7-7. Coupler, Antenna CU-421/SRA-15, Top View, Location of Parts

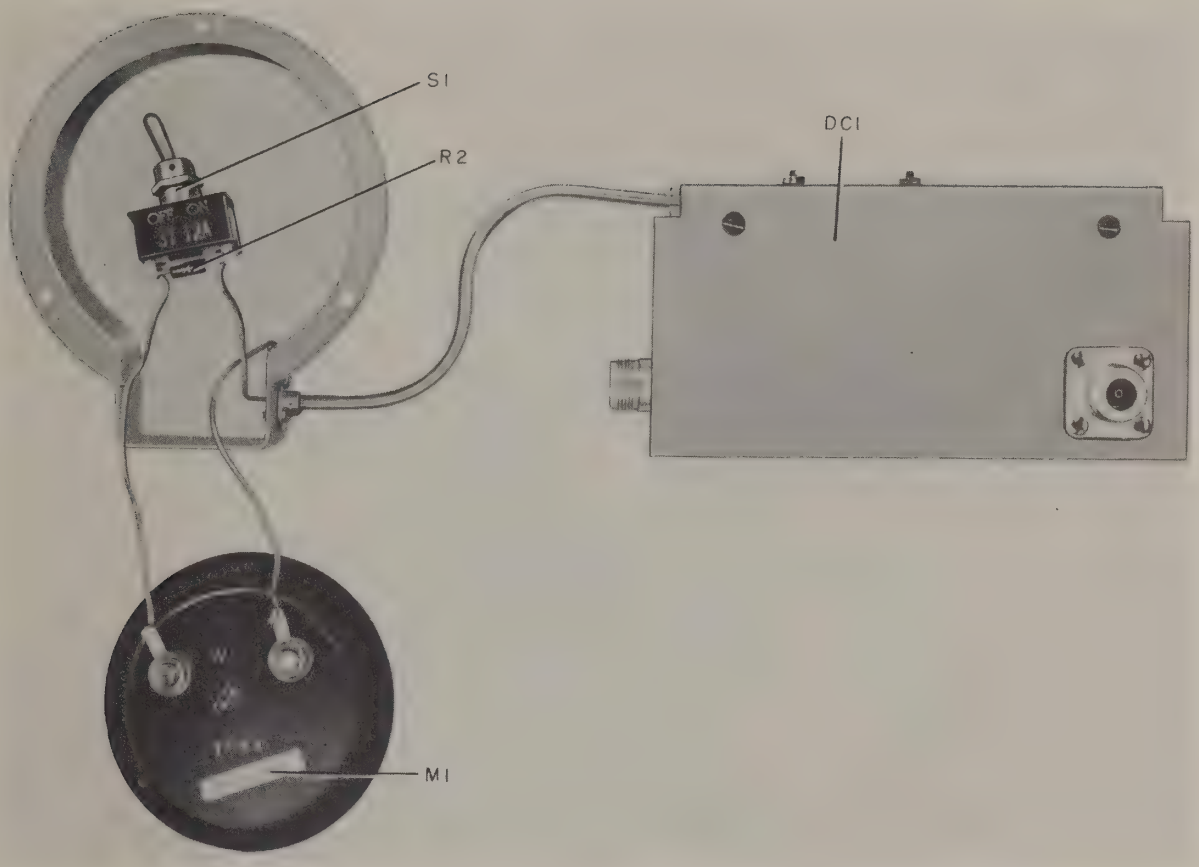


Figure 7-8. Directional Coupler DC1 and Meter Case Assembly, Location of Parts

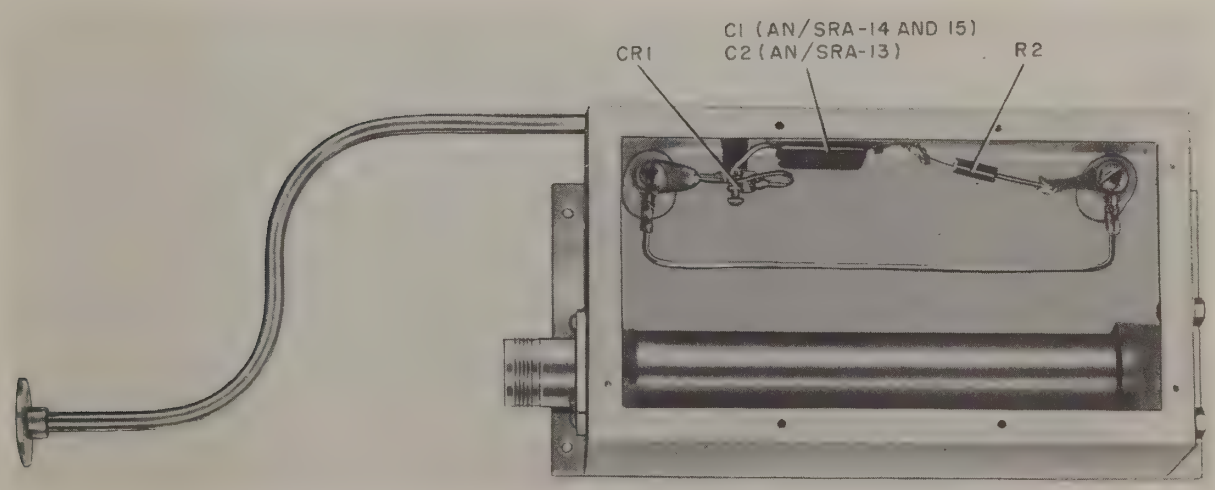


Figure 7-9. Directional Coupler DC1, Cover Removed, Location of Parts

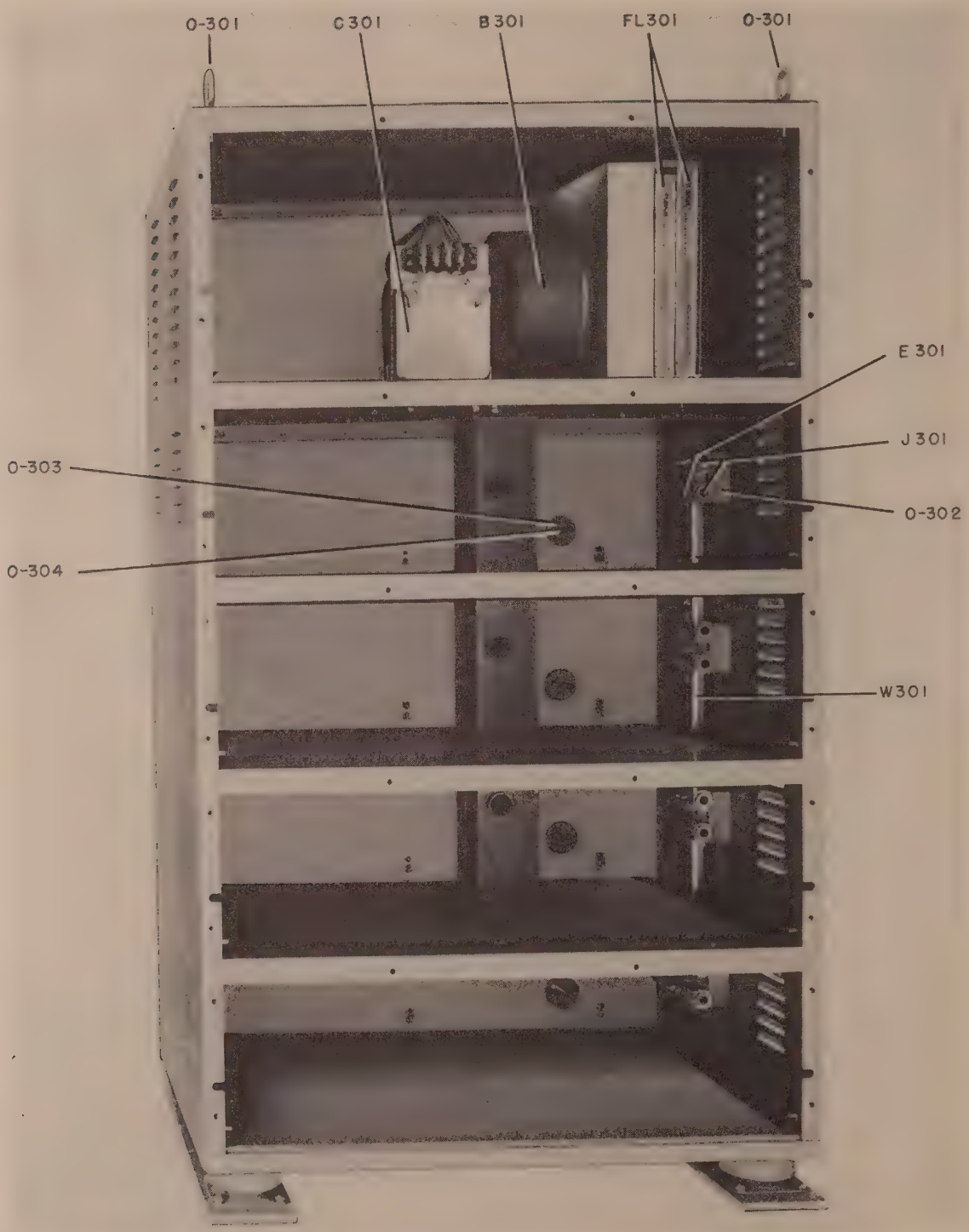


Figure 7-10. Cabinet, Electrical Equipment CY-1670/SRA, Front Oblique View, Location of Parts

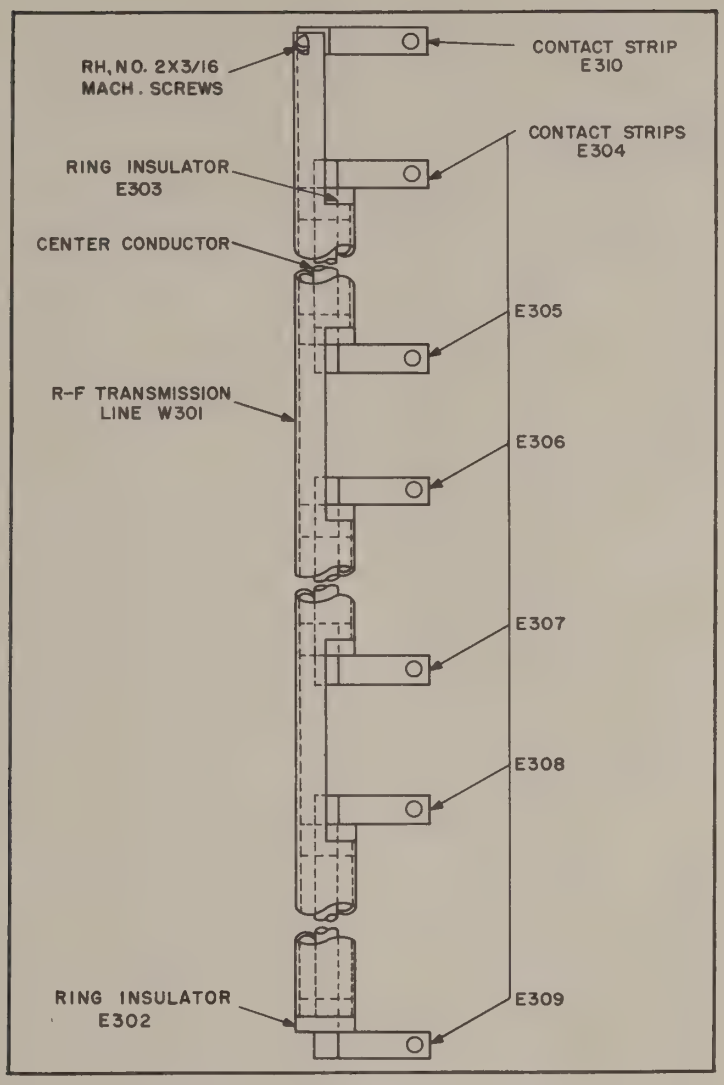


Figure 7-11. Vertical Coaxial Tube Details

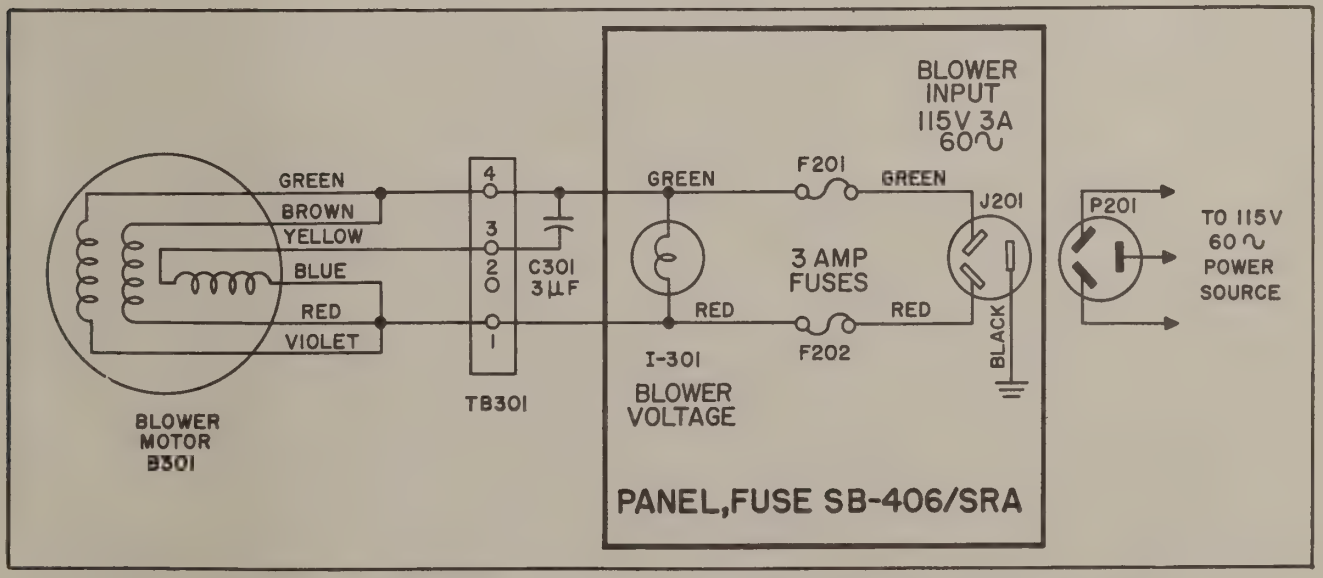
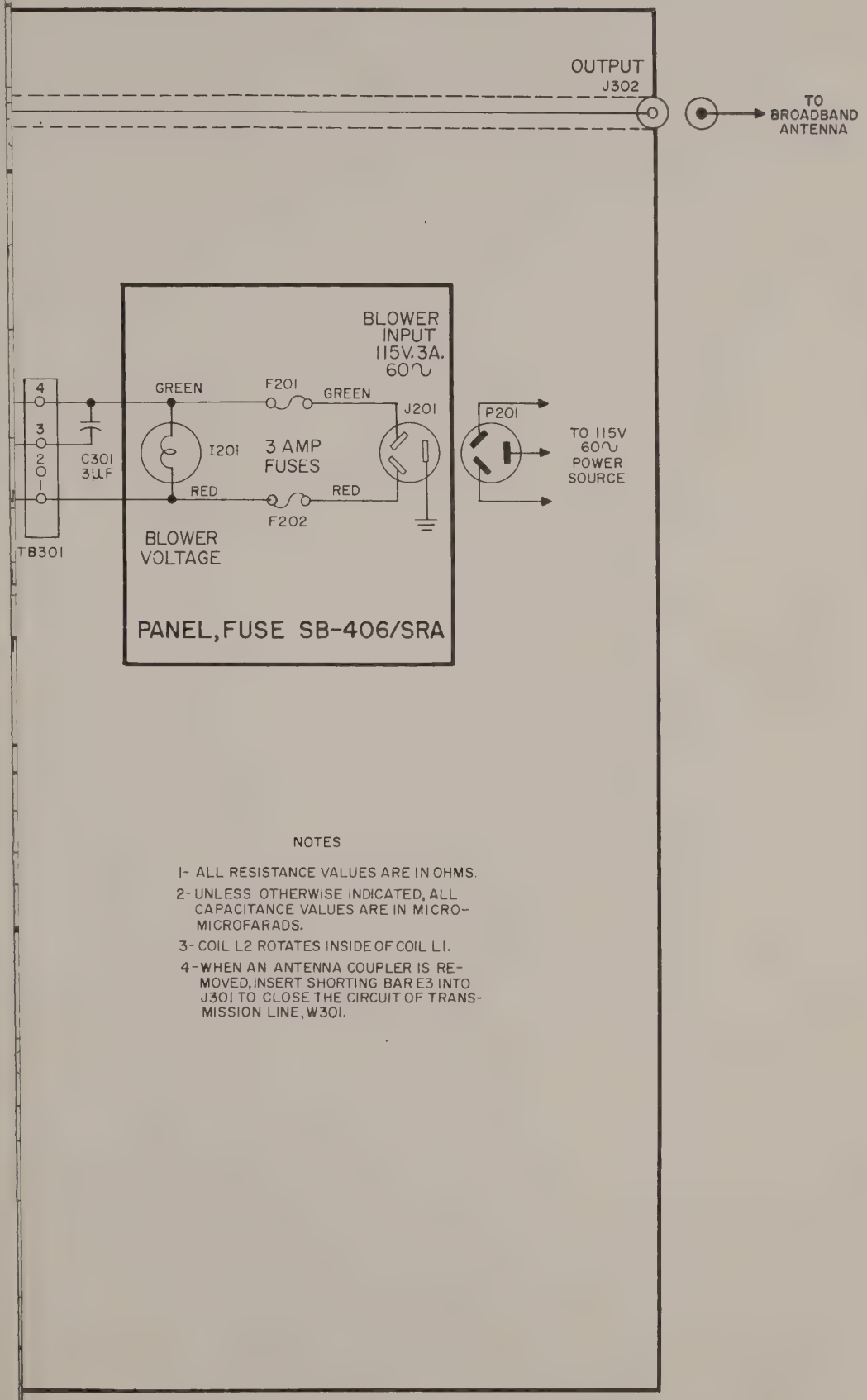


Figure 7-12. Coupler Group AN/SRA-13; -14; -15, Power Distribution Diagram



NOTES

1- ALL RESISTANCE VALUES ARE IN OHMS.

2- UNLESS OTHERWISE INDICATED, ALL CAPACITANCE VALUES ARE IN MICRO-MICROFARADS.

3- COIL L2 ROTATES INSIDE OF COIL L1.

4- WHEN AN ANTENNA COUPLER IS REMOVED, INSERT SHORTING BAR E3 INTO J301 TO CLOSE THE CIRCUIT OF TRANSMISSION LINE, W301.

7-13. Coupler Group, Antenna AN/SRA-13, Overall Schematic Diagram

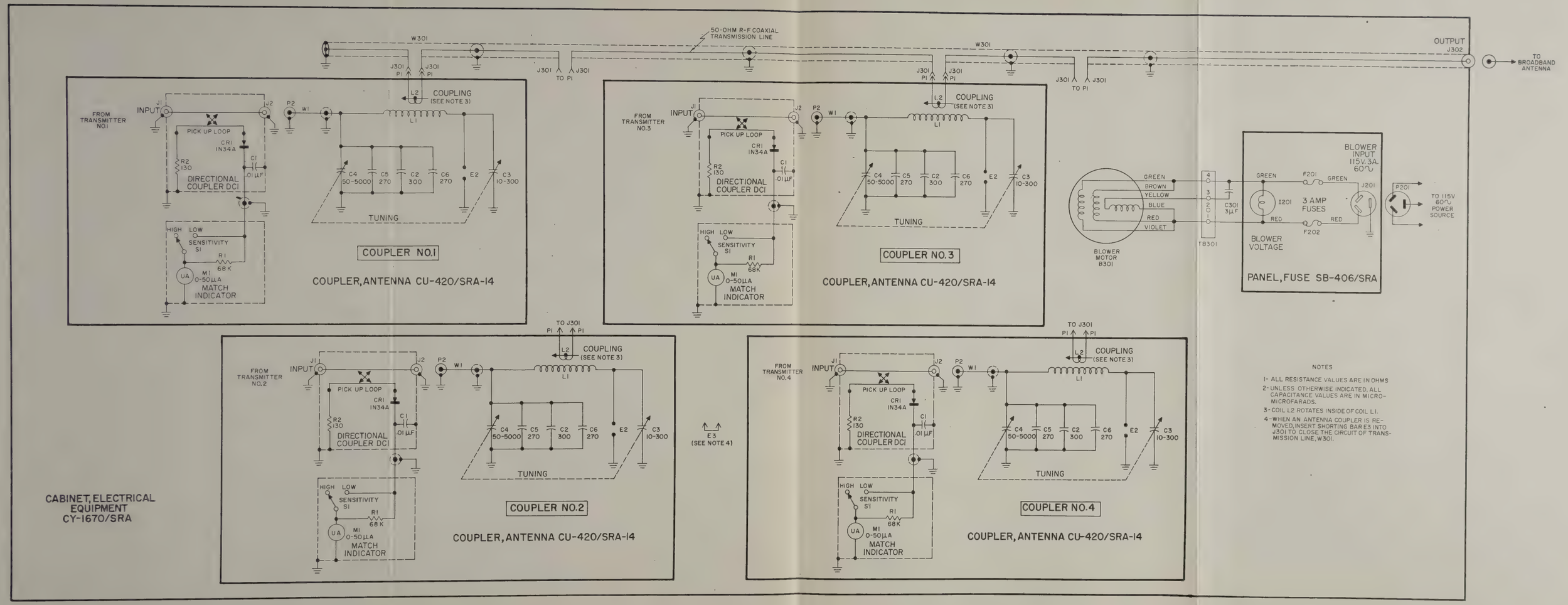


Figure 7-13. Coupler Group, Antenna AN/SRA-13, Overall Schematic Diagram

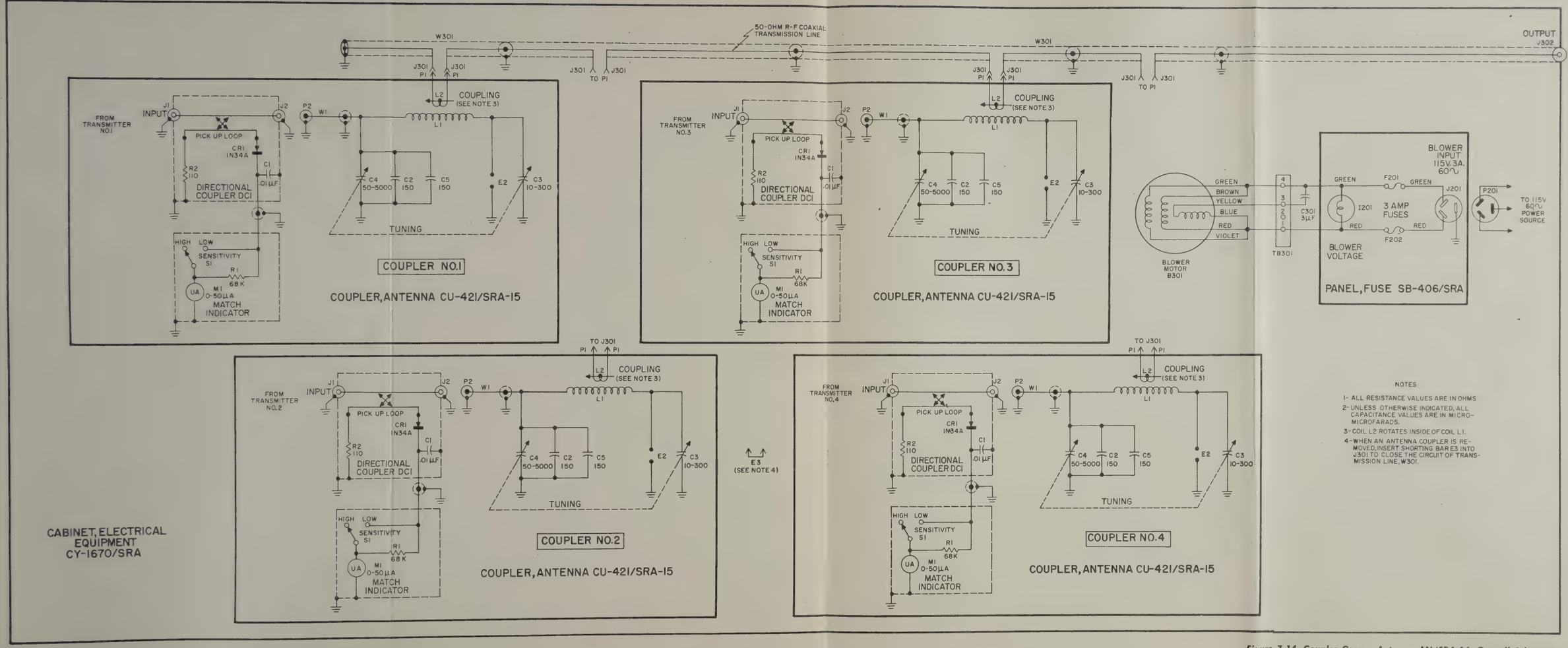


Figure 7-14. Coupler Group, Antenna AN/SRA-14, Overall Schematic Diagram

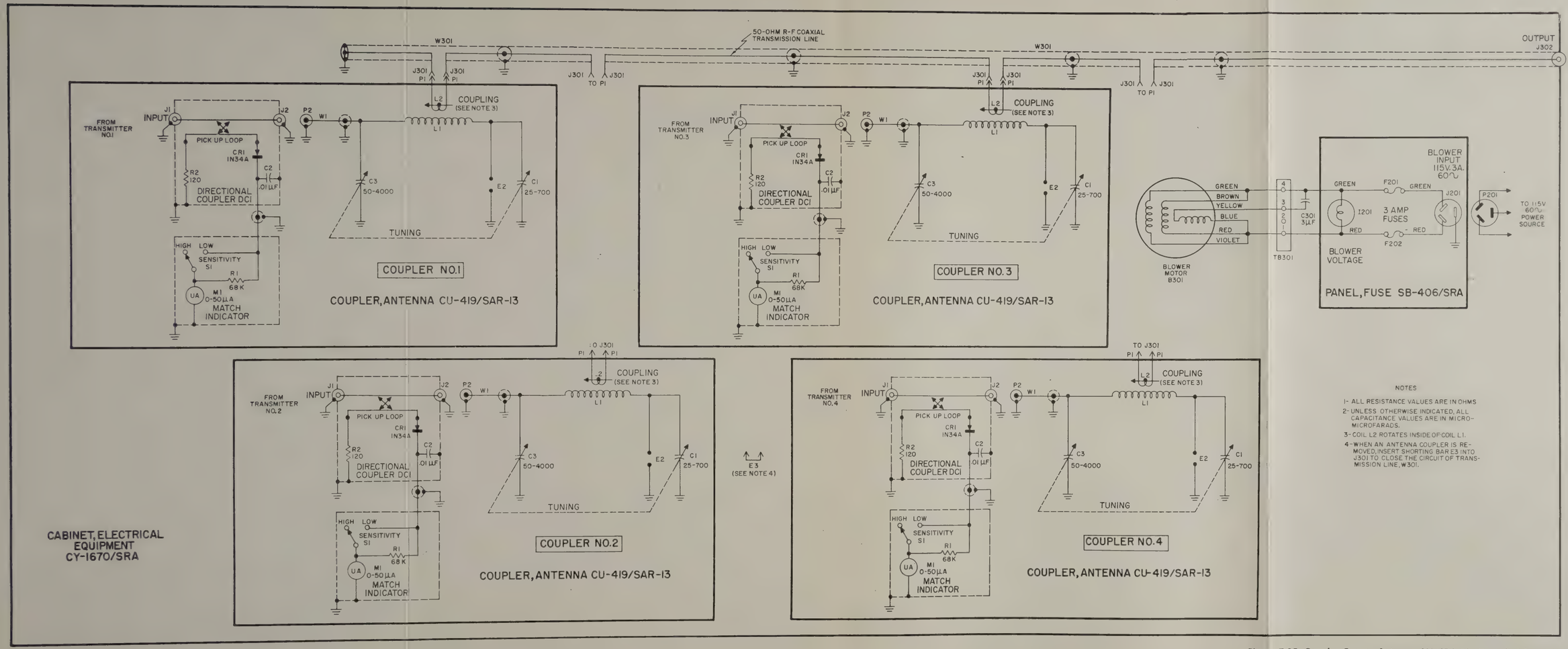


Figure 7-15. Coupler Group, Antenna AN/SRA-15, Overall Schematic Diagram

SECTION 8

PARTS LIST

1. INTRODUCTION.

Reference designations (previously referred to as circuit symbol, reference symbol, etc.) have been assigned to identify all maintenance parts of the equipment. They are used for marking the equipment (adjacent to the parts they identify) and are included on drawings, diagrams, and the parts list. The letters of a reference designation indicate the kind of part (generic group) such as resistor, amplifier, electron tube, etc. The number differentiates between parts of the same generic group. Parts of the first major unit are numbered from 1 to 57; parts of the second 201 to 202 and parts of the third 301 to 304, etc. Sockets associated with a particular plug-in device, such as a fuse, are identified by a reference designation which includes the reference designation of the plug-in device. For example, the socket for fuse F202 is designated XF201.

2. MAINTENANCE PARTS LIST.

Table 8-1 lists all major units and their maintenance parts. Each major unit's parts are grouped together.

Column 1 lists the reference series of each major unit followed by the reference designation of the various parts in alphabetical and numerical sequence.

Column 2 includes a reference to the explanatory notes that are listed in paragraph 5 below.

Column 3 includes the name and description of the various items. Complete information is provided for all key parts (a part that differs from any part previously listed in the table) and sub-key parts (a part that is identical to a key part, but appears for the first time for a given major unit). The name and description is omitted for other parts. However, reference is made to the key or sub-key part for the data.

Column 4 indicates how the part is used and provides its functional location in the equipment.

3. STOCK NUMBER IDENTIFICATION.

Table 8-2 gives stock numbers for the various items. Stock numbers preceded by a symbol apply to replacement items which may be used in either one, two or all three of the coupler groups depending upon the symbol used.

4. LIST OF MANUFACTURERS.

Table 8-3 lists manufacturers of parts used in the equipment. The prefix letters are those assigned by the Bureau of Ships to identify the manufacturers, on identification plates (nameplates) and on small parts.

5. NOTES.

The following provides additional information about items listed in tables 8-1 and 8-2.

a. Fabricate locally from bulk material having the stock number listed in table 8-2.

b. Manufacture in a Navy Shop.

c. Will be procured on demand by the nearest Naval Shore Supply Activity.

d. Non-replaceable in this application. Listed for reference only.

e. Replace by adapting or modifying the standard item having the stock number listed in table 8-2. Modify as indicated in the description.

f. Replace with substitute part having the stock number listed in table 8-2.

g. Assumed to be a low-failing item. If failure occurs, order replacement from ESO, referencing NavShips 900,180A.

h. Not used.

i. Not used.

j. Assemble from component parts.

k. Used in Coupler Group, Antenna AN/SRA-14 and AN/SRA-15.

l. Used in Coupler Group, Antenna AN/SRA-15 only.

m. Used in Coupler Group, Antenna AN/SRA-14 only.

n. Used in Coupler Group, Antenna AN/SRA-13 only.

TABLE 8-1. MAINTENANCE PARTS LIST

ANTENNA COUPLER CU-419/SRA-13 ANTENNA COUPLER GROUP AN/SRA-13

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
		COUPLER, ANTENNA CU-419/SRA-13: matches 50-ohm impedance of r-f transmission line; 2 term, input coax type, output ins feed through type; c/o 2 variable capacitors, one spiral wound coil, one loop coil; one directional coupler, one match indicator; 7-23/32" h x 24-3/4" wd x 18-3/16" d o/a; cabinet mounted, on pull-out slides, forced air cooling; freq range 2 to 6 mc, rated at 500 w; NEMS-CLARKE, Inc. part/dwg #AJ-13,766.	Matches 50-ohm impedance of r-f transmission line
C1		CAPACITOR, VARIABLE, VACUUM DIELECTRIC: com type UCSX Jennings Mfg. Co. 25-700 $\mu\mu$f—12 kv.	Impedance tuning
C2		CAPACITOR, FIXED, MICA DIELECTRIC: com .01 μf $\pm$5%, 500 v dc; Cornell Dubilier type 1DL3S1.	Microammeter M1 bypass
C3		CAPACITOR, VARIABLE, AIR DIELECTRIC: plate meshing type; two sections; capacity each section approx 50 $\mu\mu$f minimum, 4000 $\mu\mu$f maximum; midline tuning characteristic, 1400 v a-c peak voltage; no trimmers; shaft adjustment; 135° rotation of rotor blades with ccw rotation of shaft; 10-23/32 in. lg, 8-15/16 in. wd, 6-11/16 in. h; NEMS-CLARKE, Inc. part/dwg #AD-12,949.	Impedance tuning
CR1		CRYSTAL UNIT, RECTIFYING: germanium; JAN-1N34A.	Rectifier
DC1	(j)	COUPLER, DIRECTIONAL: assembly consists of a box, cover, resistor (R2), capacitor (C2), crystal (CR1), pick up loop, a tube assembly, and a connector receptacle input on one end and a connector receptacle output on the other end, plus an output wire approx 8 in. lg with a metal tubing shield soldered to the box; the box is 6-1/2 in. lg, 3-1/16 in. wd, and 2-1/4 in. h; NEMS-CLARKE, Inc. part/dwg #AC-13,292.	Part of match indicator circuit
E1		INSULATOR, STANDOFF: silicone glass laminate; 2.031 in. h 7/8 in. wd x 1 in. lg, two #8-32 thd holes x 11/16 in. d each end; NEMS-CLARKE, Inc. part/dwg #A-15,171.	Insulators for mounting blocks 048
E2	(g)	ARRESTER, ELECTRICAL SURGE: air gap type; metal; adjustable 8000 to 10,000 v range of breakdown voltages—assembly consists of cap nut, Parker-Kalon Corp. #10-24; used as an upper electrode, and a lower electrode which consists of a screw; NEMS-CLARKE, Inc. part/dwg #A-12,778; nut, plain, hexagon; NEMS-CLARKE, Inc. part/dwg #A-12,779; and a nut, hexagon, special; NEMS-CLARKE, Inc. part/dwg #A-12,777, per NEMS-CLARKE, Inc. part/dwg #AA-13,309.	Spark gap
E3		BAR ASSEMBLY, SHORTING: consists of a shorting bar, NEMS-CLARKE, Inc. part/dwg #A-12,686; and two giant banana plugs #398 Birnbach Radio Co., assembly dwg NEMS-CLARKE, Inc. part/dwg #AA-13,311.	Normally clamped to chassis; used to continue operation of coupler group when a drawer chassis is removed
E4		BAR, OUTPUT: brass, silver plate; 1-3/4 in. lg, 9/16 in. x 9/16 in. on face; two mounting holes drill #18 (0.1695) and countersink 82° x 0.336 in. diam; one connector hole drill #43 (0.089) and tap #4-40 through; one hole for mounting plug, drill #3 (0.213) x 5/8 in. d and tap #1/4-28 x 1/2 in. full thd; NEMS-CLARKE, Inc. part/dwg #B-12,692.	Mounts banana plug P1
H1		THUMBSCREW: stainless steel; knurled med diam; section B, reference drawing group 29, A-5/8 in., H-1/2 in., L-1-1/8 in., cone point #10-32 thd OD; NEMS-CLARKE, Inc. part/dwg #A-12,594.	Fastens drawer chassis to cabinet
H2	(d)	Not applicable.	Mounts frame 050 on panel
L1		COIL, RADIO FREQUENCY: single layer wound; 11 turns; nilvar rod 0.128 in. diam; silver-plate finish; 4-3/8 in. ID of coil loops, 5-1/8 in. OD, 8 in. lg; NEMS-CLARKE, Inc. part/dwg #AC-13,294.	Part of impedance matching circuit

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-419/SRA-13 ANTENNA COUPLER GROUP AN/SRA-13

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
L2		COIL, RADIO FREQUENCY: one turn; nilvar strip; silver plate; 4 in. ID, 1/2 in. wd, 0.062 in. thk; NEMS-CLARKE, Inc. part/dwg #C-12,947.	Coupling loop inside of L1
M1		AMMETER: panel mounted; dc; marked microamperes; 0-to-50 cw; full scale; marked "DC"; Weston Model, 301; bakelite case with 1/2 in. studs (MR35W 050 DCUA per MIL-M-6A).	Indicates optimum coupling
M2		COUNTER, ROTATING, FIXED MOUNTING: 4-figure counter; two counters, one for tuning, one for coupling case with flange at window; Veeder Root Series #1141; shaft rotation #4; modified per NEMS-CLARKE, Inc. part/dwg #A-12,721.	Indicates setting of tuning and coupling controls
O-1		SHAFT: R-F coil adjusting; consists of two split contact shaft assemblies with pigtail connectors, one separating insulator and one insulating sleeve; cylindrical; approx 2-1/2 in. lg, 1/2 in. diam; four tapped mounting holes #2-56 thd on 3/16 in. mtg/c; NEMS-CLARKE, Inc. part/dwg #AC-13,274.	Electrically connects coupling coil L2 to banana plugs P1
O-2	(b)	SHAFT: R-F coil adjusting; Lava #1136; cylindrical; 2-21/64 in. lg, 1/2 in. diam; two tapped mtg holes #6-32, 1/2 in. d thd; NEMS-CLARKE, Inc. part/dwg #A-12,526.	Mechanically connects coupling coil L2 to worm gear O-3
O-3		GEAR, WORM: concave type; double thd; 48 pitch; 80 teeth; 5/32 in. face; 20° pressure angle; 1.667 in. pitch diam; RH thd; Boston Gear Works part #D-1122 modified; NEMS-CLARKE, Inc. part/dwg #A-12,832.	Actuates coupling coil L2
O-4		WORM: double thd; 9/16 in. face; 0.333 in. pitch diam; 0.1309 in. thd lead; RH thd; 7° 7′ lead angle; 48 pitch; Boston Gear Works part #DSH modified; NEMS-CLARKE, Inc. part/dwg #A-12,822.	Meshes with worm gear O-3
O-5	(g)	BEARING, SLEEVE: brass, nickel plated; 3/4 in. OD, 1/2 in. ID, 1-1/16 in. lg, with flange 1-9/16 in. diam, 1/8 in. thk 7/32 in. from one end; four tapped #4-40 thd holes; NEMS-CLARKE, Inc. #A-12,833.	Bearing for shaft O-2
O-6	(g)	STOP, GEAR: cad plated; approx 2-1/8 in. diam, 3/32 in. thk; four 1/8 in. diam. mounting holes 90° apart on circle with 0.625 in. rad; NEMS-CLARKE, Inc. part/dwg #B-12,843.	Mounts on worm gear O-3 to prevent coupling coil L2 from overshooting
O-7	(b)	STOP: assembly consists of collar 7/16 in. OD by 3/16 in. ID with #4-40 tapped 0.089 in. diam setscrew hole, 6-0 taper pin hole half drilled; brass, nickel plated; NEMS-CLARKE, Inc. part/dwg #A-12,839 and pin 0.078 in. diam, 7/32 in. lg; stainless steel; NEMS-CLARKE, Inc. part/dwg #A-12,835, per NEMS-CLARKE, Inc. assembly dwg #AA-13,096.	Engages with stop O-6
O-8	(b)	SHAFT: worm drive; stainless steel; 3/16 in. diam by 2-25/32 in. lg with shoulder 1/4 in. diam by 3/4 in. face on one end; NEMS-CLARKE, Inc. part/dwg #A-12,837.	Connects to worm drive O-4
O-9	(b)	COLLAR, SHAFT: brass, nickel plated; 3/8 in. OD by 1/4 in. lg with 0.188 in. hole, tapped setscrew hole 0.089 in. diam with #4-40 thd, taper pin hole 0.063 in. diam, half drilled; NEMS-CLARKE, Inc. part/dwg #A-12,834.	Prevents excessive end-play of worm-drive shaft O-8
O-10	(b)	BRACKET: square "U" shape; brass, nickel plated; 15/16 in. high by 1/2 in. wide by 1-3/4 in. lg; two 3/16 in. diam mounting holes on 1 in. mtg/c; two shaft holes 0.188 in. diam; NEMS-CLARKE, Inc. part/dwg #A-12,836.	Supports worm-drive shaft O-8
O-11		COUPLING, SHAFT, FLEXIBLE: ceramic; 1 in. OD with 1/4 in. shaft holes; Cardwell Mfg. Co. part #PL5000-A.	Couples dial-drive shaft O-12 to worm drive shaft O-8
O-12	(b)	SHAFT: dial drive; stainless steel; 1/4 in. diam, 6 in. lg; one end 3/16 in. diam, 1-5/8 in. face; NEMS-CLARKE, Inc. part/dwg #A-12,789.	Connects COUPLING knob to coupling O-11

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-419/SRA-13 ANTENNA COUPLER GROUP AN/SRA-13

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O-13	(g)	BEARING, SLEEVE: assembly consists of dial drive shaft bearing; brass, nickel plated; 1/2 in. OD; 3/16 in. ID, 3/8 in. lg overall with 9/16 in. hex flange one end, #1/2-20 thd 1/4 in. d other end; NEMS-CLARKE, Inc. part/dwg #A-12,590-3; lock washer, 1/2 in. internal tooth; phos bronze, nickel plated; nut 3/4 in. hex 1/8 in. thk; brass, nickel plated; NEMS-CLARKE, Inc. part/dwg #A-12,591.	Bearing for dial-drive shaft O-12
O-14	(g)	DIAL: assembly; scale 0 to 10 left to right with increments of 10; 3-1/4 in. diam., 1/32 in. thk; three knob mounting holes 0.128 in. diam. 120° apart on 15/32 in. rad; black anodize finish; white engraved markings; NEMS-CLARKE, Inc. part/dwg #A-12,588; knob 2-1/4 in. diam., 1-1/16 in. lg; folding handle opens to 4 in. diam; 3/16 in. hole; black anodize finish; fluted; NEMS-CLARKE, Inc. part/dwg #B-12,678-3, per NEMS-CLARKE, Inc. assembly dwg #AC-13,112-3.	Dial assembly for COUPLING control
O-15	(g)	DIAL: assembly; scale 0 to 10 left to right with increments of 10; 3-1/4 in. diam., 1/32 in. thk; three knob mounting holes 0.128 in. diam. 120° apart on 15/32 in. rad; black anodize finish; white engraved markings; NEMS-CLARKE, Inc. part/dwg #A-12,588; knob 2-1/4 in. diam, 1-1/16 in. lg; folding handle opens to 4 in. diam; 3/16 in. hole; black anodize finish; fluted; NEMS-CLARKE, Inc. part/dwg #B-12,678-2, per NEMS-CLARKE, Inc. assembly dwg #AC-13,112-2.	Dial assembly for TUNING control
O-16		GEAR, MITER: straight type; brass; 18 teeth; 7/64 in. face; 3/8 pitch diam; 3/16 in. bore; #6-32 tapped setscrew hole, taper pin hole 0.078 in. diam, half drilled; Chicago Gear Works part #M-103; NEMS-CLARKE, Inc. part/dwg #A-13,069-2.	Matched gears connected to dial-drive shaft O-12
O-17		GEAR, MITER: straight type; brass; 18 teeth; 7/64 in. face; 3/8 in. pitch diam; 1/8 in. bore; #6-32 tapped setscrew hole, taper pin hole 0.078 in. diam, half drilled; Boston Gear Works part #G-461; NEMS-CLARKE, Inc. part/dwg #A-13,070.	Matched gears used to drive counter M2 of COUPLING control
O-18		COUPLING: stainless steel: 1-7/32 in. lg with shoulder 1-1/16 in. lg. x 3/4 in. diam, collar 5/32 in. lg x 1/2 in. diam; shoulder bored 0.5 in. diam for 11/16 in. and collar bored 0.375 in. diam for 9/16 in.; four #6-32 tapped setscrew holes 90° apart; NEMS-CLARKE, Inc. part/dwg #A-15,193.	Couples vacuum capacitor to helical gear O-20
O-19	(d)	Not applicable.	Nut for helical-gear drive shafts O-22 and O-23
O-20		GEAR, HELICAL: single helical tooth type; steel; 24 teeth; 1/4 in. face; 14-1/2° press angle; 1 in. pitch diam; 45° helix angle; LH teeth; hardened; 1/2 in. bore, 1/8 in. by 1/16 in. keyway; Boston Gear Works part #H2424-L.	Drives vacuum capacitor C1 from shafts O-22 and O-23
O-21		BEARING, BALL: single row annular; double shield; light duty; 3/8 in. bore; 7/8 in. OD, 7/32 in. wd; 7 balls 5/32 in. diam; std slush grease; New Departure part #77-R-6.	Bearings for shafts O-22 and O-23
O-22	(b)	SHAFT: helical gear drive; stainless steel; 3/8 in. diam, 3-1/2 in. lg, shoulder in center 1/2 in. diam 15/64 in. wd with keyway; #5/16-24 thd one end approx 1/2 in. lg; NEMS-CLARKE, Inc. part/dwg #A-12,924.	Drives helical gear O-20
O-23	(b)	SHAFT: helical gear drive; stainless steel; 3/8 in. diam, 2-3/8 in. lg shoulder in center, 1/2 in. diam 15/64 in. wd with keyway; #5/16-24 thd one end approx 1/2 in. lg; other end reduced to 5/16 in. diam 1/2 in. lg; NEMS-CLARKE, Inc. part/dwg #A-12,925.	Drives helical gear O-20
O-24	(b)	BUSHING, PLAIN, FLANGED: brass, nickel plated; 1/2 in. OD by 0.376 in. ID, 0.906 in. lg; flange one end 11/16 in. diam 1/8 in. thk; NEMS-CLARKE, Inc. part/dwg #A-12,922.	Maintains distance between bearings O-21 and helical gear O-20 on shaft O-22

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-419/SRA-13 ANTENNA COUPLER GROUP AN/SRA-13

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O-25	(b)	BUSHING, PLAIN, FLANGED: brass, nicked plated; 15/32 in. OD by 0.375 in. ID 0.406 in. lg; flange one end 11/16 in. diam 1/8 in. thk; NEMS-CLARKE, Inc. part/dwg #A-12,614.	Maintains distance between bearings O-21 and helical gear O-20 on shaft O-23
O-26	(g)	COUPLING: assembly consists of one phenolic sleeve 15/32 in. OD with 1/4 in. wd, 3/4 in. OD shoulder in center, 5/16 in. shaft hole 1 in. lg, taper pin and setscrew holes in each end, per NEMS-CLARKE, Inc. part/dwg #A-12,668-1. Two brass nickel plated collars, one each end 3/4 in. OD 0.469 in. ID with #6-32 tapped setscrew hole and 0.110 in. diam taper pin hole half drilled at each end; NEMS-CLARKE, Inc. parts/dwg #A-12,667, per NEMS-CLARKE, Inc. assembly dwg #AA-13,083-1.	Couples helical-gear drive shaft O-23 to worm-gear drive shaft O-27
O-27		SHAFT, GEAR, WORM: two worms—one RH, one LH; cut on one shaft, all one piece; stainless steel; shaft 3/8 in. diam, 8-11/16 in. lg with both ends reduced to 5/16 in. diam 7/16 in. d; three shoulders 0.549 in. diam; one RH, one LH worm; single thd, diametral pitch 48, norm. press angle 14-1/2°, norm diam pitch 48.042, helix angle 2° 23′ 8″, pitch diam 5 in., OD 0.5416 in.; NEMS-CLARKE, Inc. part/dwg #B-21,439.	Operates worm gears O-28 and O-29
O-28		GEAR, WORM: concave type; single thd; 14-1/2° press angle; 1.2917 in. pitch diam; RH thd; 2° 23′ 8″ helix angle; 0.229 in. throat rad; 1.333 in. throat diam; bronze; 1.354 in. OD; 1/4 in. diam bore; NEMS-CLARKE, Inc. part/dwg #B-12,438-1.	Rotates rear section of air-dielectric capacitor C3
O-29		GEAR, WORM: concave type; single thd; 14-1/2° press angle; 1,2917 in. pitch diam; LH thd; 2° 23′ 8″ helix angle; 0.229 in. throat rad; 1.333 in. throat diam; bronze; 1.354 in. OD; 1/4 in. diam bore; NEMS-CLARKE, Inc. part/dwg #B-12,438-2.	Rotates front section of air-dielectric capacitor C-3
O-30	(g)	STOP, GEAR: CRS, cad plated; approx 1-3/4 in. diam by 1/16 in. thk; three elongated 1/16 in. diam mounting holes equal distance apart on 3/4 in. rad; NEMS-CLARKE, Inc. part/dwg #B-12,946.	Mounts on worm gear O-29 to prevent overshooting
O-31	(g)	STOP, GEAR: CRS, cad plated; 13/16 in. OD, RH stopping cam, .550 in. ID, one #6-32 tapped 0.106 in. setscrew hole, one taper pin hole 90° apart; NEMS-CLARKE, Inc. part/dwg #A-12,909.	Mounts on RH worm of shaft O-27 to prevent overshooting
O-32	(g)	STOP, GEAR: CRS, cad plated; 13/16 in. OD, RH stopping cam; .550 in. ID, one #6-32 tapped 0.106 in. setscrew hole, one taper pin hole 90° apart; NEMS-CLARKE, Inc. part/dwg #A-12,931.	Mounts on LH worm of shaft O-27 to prevent overshooting
O-33	(b)	BRACKET: bearing mount, worm shaft support; aluminum angle; 1-5/16 in. h, 1-1/4 in. wd, 1-1/8 in. lg, 3/8 in. thk; four 0.182 in. diam mounting holes, two 0.125 in. diam centering holes; RH bearing press fit counterbore approx 7/8 in. diam on 3/4 in. diam hole; NEMS-CLARKE, Inc. part/dwg #A-12,918.	Bearing mount for rear end of worm-gear shaft O-27
O-34	(b)	BRACKET: bearing mount, worm shaft support; aluminum angle; 1-5/16 in. h, 1-1/4 in. wd, 1-1/8 in. lg, 3/8 in. thk; four 0.182 in. diam mounting holes; two 0.125 in. diam centering holes; RH bearing press fit ctb approx 7/8 in. diam on 3/4 in. diam hole; NEMS-CLARKE, Inc. part/dwg #A-12,919.	Bearing mount for front end of worm-gear shaft O-27
O-35	(g)	BEARING, SLEEVE: assembly consisting of dial drive shaft bearing; brass, nickel plated; 1/2 in. OD, 5/16 in. ID, 3/8 in. lg over-all, 9/16 in. hex flange one end; #1/2-20 thd 1/4 in. d other end; NEMS-CLARKE, Inc. part/dwg #A-12,590-2; lock washer 1/2 in. internal tooth phosphor bronze, nickel plated; nut 3/4 in. hex 1/8 in. thk; brass nickel plated; NEMS-CLARKE, Inc. part/dwg #A-12,591.	Bearing for worm-gear shaft O-27
O-36		GEAR, BEVEL: straight type, brass; 32 teeth, 5/32 in. face; 1 in. pitch diam; tapped #6-32 thd setscrew hole; #36 taper pin hole 90° apart; 5/16 in. diam bore; 11/32 in. backing; Chicago Gear Works part #B-119 modified; NEMS-CLARKE, Inc. part/dwg #A-13,088-1.	Matched gear for counter-drive shaft O-56 of TUNING control

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-419/SRA-13 ANTENNA COUPLER GROUP AN/SRA-13

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O-37		GEAR, BEVEL: straight type; brass; 16 teeth 5/32 in. face; 1/2 in. pitch diam; tapped #6-32 thd setscrew hole, 90° apart; 3/16 in. diam bore, 7/32 in. backing; Chicago Gear Works part #B-119 modifiedw; NEMS-CLARKE, Inc. part/dwg #A-13,088-2.	Matched gear for counter-drive shaft O-56 of TUNING control
O-38		GEAR, BEVEL: straight type brass; 18 teeth; 1/8 in. face; 3/8 in. pitch diam, two tapped #4-40 thd setscrew holes; 90° apart; 1/8 in. bore; 7/32 in. backing; Chicago Gear Works part #B-117 modified NEMS-CLARKE, Inc. part/dwg #A-13,089-2.	Matched gear for driving counter M2 of TUNING control
O-39		GEAR, BEVEL: straight type; brass; 36 teeth, 1/8 in. face; 3/4 in. pitch diam; 2 tapped #4-40 thd setscrew holes; 90° apart; 1/8 in. bore; 1/4 in. backing; Chicago Gear Works part #B-117 modified; NEMS-CLARKE, Inc. part/dwg #A-13,089-1.	Matched gear for driving counter M2 of TUNING control
O-40		CLAMP, ELECTRICAL: dial locking assembly, consisting of a knob, spacer, pivot guide, pin, special washers, and associated hardware; NEMS-CLARKE, Inc. part/dwg #AB-13,111.	Locking assembly for COUPLING dial O-14 and TUNING dial O-15
O-41	(b)	BLOCK, BEARING: brass, nickel plate; height 11/16 in. base 1-3/8 in. x 1 in. including 1/4 in. flange with 4 tapped mounting holes #43 (0.089 in.) drill #4-40 thd, 1 in. c to c; bearing hole 0.187 in. diam, 0.406 in. from base through length of block; NEMS-CLARKE, Inc. part/dwg #A-12,729.	Bearing block for counter-drive shaft O-42
O-42	(b)	SHAFT: counterdrive; stainless steel, 5/16 in. OD, 2-11/16 in. lg; section 1-7/8 in. lg has 3/16 in. diam, section 11/16 in. lg has 1/8 in. diam; ring 3/16 in. lg has 5/16 in. diam; NEMS-CLARKE, Inc. part/dwg #A-12,730.	Counter-drive shaft for COUPLING circuit
O-43	(g)	CLAMP: electrical; brass, silver plated; formed strip 1-1/8 in. radius, with tabs mounted on a U shaped bracket 1/8 in. thk with 3/8 in. hole in c; NEMS-CLARKE, Inc. part/dwg #AA-15,178.	Support for vacuum capacitor C1
O-44	(g)	CLAMP: holding; brass, silver plated; formed strip 1 in. wd x 1/8 in. thk; NEMS-CLARKE, Inc. part/dwg #A-15,173-2.	Clamps vacuum capacitor C1 in position
O-45	(g)	CLIP: retaining; phosphor bronze, nickel plate; 1-3/8 in. lg, 3/4 in. wide, 3/4 in. high; two 5/16 in. sq tabs for securing clip to chassis; NEMS-CLARKE, Inc. part/dwg #A-12,688.	Holds shorting bar assembly E3
O-46	(g)	CLIP: locking; phosphor bronze, nickel plate; 3/4 in. lg, 3/4 in. wide, 0.032 in. thk; NEMS-CLARKE, Inc. part/dwg #A-12,687.	Locks clip O-45
O-47	(g)	BUSHING: reducing fitting; brass; tubing; 1-1/2 in. lg, 1-7/8 in. OD, 1.593 in. ID, approx. 1/8 in. thk; NEMS-CLARKE, Inc. part/dwg #A-12,923.	Reducing fitting for thimble of vacuum capacitor C1
O-48	(b)	MOUNTING: block; silicone glass laminate; 3-3/4 in. lg, 1 in. wd, 1/2 in. thk; 4 holes drill #18 (0.169) and center bore 3/8 in. diam by 1/4 in. d; 1 center hole, drill #4 (0.218) NEMS-CLARKE, Inc. part/dwg #A-12,934.	Mounting for vacuum capacitor C1
O-49	(b)	HOLDER, WRENCH: No. 3, full size, bronze; connector, wire, Fahnstock Electric Co. nomenclature.	Mounts #4, #6, and #8 Allen wrenches
O-50	(d)	FRAME: aluminum alloy, black anodize finish; 4 in. lg, 2-11/16 in. wd, 3/16 in. thk; 4 corner holes drill #22 (0.157) diam; NEMS-CLARKE, Inc. part/dwg #A-12,615.	Holder for calibration chart
O-51	(b)	WINDOW: lucite, clear; 3-7/8 in. lg, 2-9/16 in. wd, 1/32 in. thk; purchased from Colonial Kalomite Co.; NEMS-CLARKE, Inc. part/dwg #A-12-616.	Cover for calibration chart
O-52	(g)	FASTENER, LATCH: safety catch assembly, consisting of an assembly stop, arm, bearing, stop, screw, spring posts and associated hardware; NEMS-CLARKE, Inc. part/dwg #AB-13,276.	Safety catch assembly for drawer chassis
O-53	(g)	BUSHING, PLAIN, FLANGED: Shape style No. 2A, section A, 11, Ref Dwg Group 191, aluminum alloy; 1.126 in. OD, 0.7812 in. ID, 0.25 in thk; NEMS-CLARKE, Inc. part/dwg #A-12,801.	Bushing for helical-gear drive shaft O-23

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-419/SRA-13 ANTENNA COUPLER GROUP AN/SRA-13

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O-54	(g)	GUIDE, DRAWER: stainless steel; one end flanged; flange flattened two sides 1-1/4 in. lg, 7/8 in. max OD flange, 3/4 in. wd on flat side of flange; external thd #5/8-24; center hole 0.313 in. diam with flange end chamf 1/16 x 30°; NEMS-CLARKE, Inc. part/dwg #A-12,584.	Receives drawer - chassis guide pin O-304
O-55	(b)	SHAFT: stainless steel, passivate finish; 5/16 in. OD, 2-7/8 in. lg; 7/16 in. lg keyway 1/32 in. d with a 1/32 in. rad; 1/32 x 45° chamf both ends; NEMS-CLARKE, Inc. Mach. part/dwg #A-12,799.	Drive shaft for TUNING control
O-56	(b)	SHAFT: stainless steel; passivate finish; 5/16 in. max OD, 2-1/2 in. lg; 5/16 in. diam collar, 1/8 in. lg with one side chamf 1/64 x 30°, 1-5/16 in. from one end; shank 1-5/16 in. lg has 0.186 in. diam; other end has 1-7/16 in. lg section, 1/8 in. diam; both ends of shaft are chamf 1/64 x 45°; NEMS-CLARKE, Inc. part/dwg #A-13,410.	Counter-drive shaft for TUNING control
O-57	(b)	BLOCK, BEARING: for counter drive shaft; brass, nickel plated; height 11/16 in., base 1 in. x 0.910 in. including 1/4 in. flange each side of broad dimension; two mounting holes in each flange, #43 (0.089) drill and tap #4-40, 1/2 in. c to c; bearing hole 0.187 in. diam 0.406 in. from base, runs length of the block; NEMS-CLARKE, Inc. part/dwg #A-13,413.	Bearing block for counter-drive shaft O-56
P1		CONNECTOR, PLUG: giant banana plug #398 Birnbach Radio Co.	Connects coupler to receptacle J301
P2		CONNECTOR, PLUG: UG-21B/U, per Navy dwg RE49F402.	Used on cable W1 to connect directional coupler DC1 to air-dielectric capacitor C3
R1		RESISTOR, FIXED, COMPOSITION: body style No. 14, Ref. Dwg Group 2; 6200 ohms; ±5% tolerance; 1/2w; Allen-Bradley.	Limiting resistor
R2		RESISTOR, FIXED, COMPOSITION: 120 ohms total resistance; ±5% tolerance; 2w; Allen-Bradley.	Part of directional coupler DC1
S1		SWITCH, TOGGLE: SPST; 2 positions; ST12A per JAN-S-23 spec.	Sensitivity switch for meter M1
W1	(j)	CABLE, SPECIAL PURPOSE, ELECTRICAL: assembly consists of connector UG-21B/U; coaxial cable RG-8/U, 17-3/8 in. lg; ground strap soldered to one end and lug soldered to conductor at the same end, NEMS-CLARKE, Inc. part/dwg #AA-13,308-2.	Connects directional coupler DC1 to air-dielectric capacitor C3

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

FUSE PANEL SB-406/SRA ANTENNA COUPLER GROUP AN/SRA-13

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
		PANEL, FUSE SB-406/SRA: Contains four fuses, indicator lamp, connector and receptacle; 11-7/32 in. h x 24-3/4 in. wd x 10-3/8 in. d; cabinet mounted, on pull-out slides; NEMS-CLARKE, Inc. part/dwg #AF-13,776.	Mounts components for protecting blower assembly
E201		CLAMP, ELECTRICAL: cable clamp; AN3057-6 Amphenol.	Clamps power cable on P201
F201		FUSE, CARTRIDGE: Navy type 28032-3; 3 amp; blowing time, life at 110%, 1 hr at 135%, 5-6 sec at 200% load; 250 v; one time; glass body; ferrule term; 1-1/4 in. lg x 1/4 in. diam at each end; Littelfuse (LTF) type 3AG, part #1043.	A-C line
F202		Same as F201.	A-C line
XF201		FUSE HOLDER: in-the-line type; 250V, 3 amp; two holders are for one line fuse each; two holders are for one spare fuse each; coml. H.K.P. Bussman Mfg. Co.	Holder for line and spare fuses
I-201		LAMP, INCANDESCENT: double contact, bayonet type; replaceable from the front of the cabinet; 120v, 6w; 6S6 DC General Electric.	Signal lamp to indicate blower unit is operating
J201		CONNECTOR, RECEPTACLE: AN3102A-14S-7P Amphenol.	Power input receptacle
P201		CONNECTOR, PLUG: 90° angle plug; AN-3108B-14S-7S Amphenol.	Power input plug
XI-201	(d)	Not Applicable	Holder for lamp I-201 and lens XI-202
XI-202		LENS: INDICATOR LIGHT: includes lensholder; catalog #51-112 Dial Light Corp.	Lens for lamp I-201

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ELECTRICAL EQUIPMENT CABINET CY-1670/SRA — ANTENNA COUPLER GROUP AN/SRA-13

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
		CABINET, ELECTRICAL EQUIPMENT CY-1670/SRA: Contains four antenna couplers, a fuse panel, blower assembly, vertical coaxial tube, and air ducts; 46-3/4 in. h x 26-1/4 in. wd x 20-1/2 in. d; NEMS-CLARKE, Inc. part/dwg #AC-13,050.	Contains major units and assemblies of Coupler Group, Antenna AN/SRA-13
B301		MOTOR, ALTERNATING CURRENT: dual voltage; 115/230V ac; model DRCP, type KS-505-CCW, series 153 BS Rotron Mfg. Co.	Motor for blower unit
C301		CAPACITOR, FIXED, PAPER DIELECTRIC: 3 μf; 220V R.B.F. #701 Aerovox.	Motor starting capacitor
E301	(g)	BLOCK, CONTACT: brass silver-plate finish; 2 in. lg, 3/4 in. sq.; two mounting holes, drill #17 (0.173 diam); end hole for jack, drill #29/64 (0.453) and tap #1/2-20 x 7/8 d; center bore 17/32 x 1/16 in. d; NEMS-CLARKE, Inc. part/dwg #A-12,685.	Holder for J301 (8 per set)
E302		INSULATOR, RING: lava, grade "A", white; dimensions Ref. Dwg. Group 9, item code No. 90, D-5/8 in. F-0.561 in., H-0.25 in., L-3/8 in., E-3/16 in.; NEMS-CLARKE, Inc. part/dwg #A-12,524.	For bracing as well as insulating conductor rod in r-f transmission line W301 (5 per set)
E303		INSULATOR, RING: lava, grade "A", white; dimensions 0.561 in. OD, 0.250 in. ID, 3/8 in. thk, shoulder; per NEMS-CLARKE, Inc. part/dwg #A-12,525.	For bracing as well as insulating one end of conductor rod of r-f transmission line W301 (1 per set)
FL301		FILTER, AIR CONDITIONING: fiberglas; 10 in. by 10 in. by 1 in.; Owens Corning Corp.	Filter for blower unit (2 per set)
J301		CONNECTOR, RECEPTACLE: giant jack; #399 Birnbach Radio Co.	Receptacle for banana plug J1 (8 per set)
J302		CONNECTOR, RECEPTACLE: UG-352A/U; per Navy dwg RE49F509.	Output jack (to antenna)
O-301	(d)	Not Applicable	Lifting ring (4 per set)
O-302	(b)	MOUNTING: block; silicone glass laminated; 2-1/4 in. lg, 2 in. wd, 7/8 in. thk; 4 mounting holes, drill #7 (0.201) and tap #1/4-20 through, center bore 0.328 in. diam x 7/64 (0.109) in. d; four rosan inserts (cat. #R104SB-6) in. mounting holes and two rosan inserts (cat. #R106SB-8) in holes for jack holder, these two holes are 5/16 in. (0.312) diam drill and tap #3/8-16 through center bore 0.437 in. diam x 5/32 in. (0.156) d; NEMS-CLARKE, Inc. part/dwg #B-12,689.	Mounts contact blocks E301 (4 per set)
O-303	(b)	MOUNTING: block; stainless steel; 1/2 in. diam, 5/16 in. thk; center hole drill "F" (0.257) diam and tap #5/16-18 thd; three mounting holes 120° apart on 19/32 in. rad drill #36 (0.106) diam and tap #6-32 thd; NEMS-CLARKE, Inc. part/dwg #A-12,581-2.	Mounts guide pin O-304 (4 per set)
O-304	(b)	PIN, STRAIGHT, HEADED: stainless steel, passivate finish; 1-15/16 in. over-all length; shank end 1-1/2 in. lg, 0.312 in. diam, end pointed 1/32 in. rad 30°; square collar 5/16 in. from other end 1/8 in. thk, 3/4 in. on a side, corners rounded on a 7/16 in. rad; end section 5/16 in. lg, threaded 5/16-18; NEMS-CLARKE, Inc. part/dwg #A-13,516.	Aligns drawer chassis in cabinet (4 per set)
TB301		STRIP, TERMINAL: general-purpose terminal strip; 4 double screw type terminals; bakelite; 3-1/4 in. lg x 1-9/32 in. wd x 5/8 in. thk; Howard B. Jones Division of Cinch Man. Corp. part #4-142.	Connections for input power
W301	(g)	LINE, RADIO FREQUENCY TRANSMISSION: coaxial type; 50 ohms characteristic impedance; line has three inner line conductors brass, silver plated, 0.250 in. diam, 6-9/16 in. lg; outer conductor, 5/8 in. OD, 9/16 in. ID, brass telescopic tubing, silver plated; NEMS-CLARKE, Inc. part/dwg #AB-12,550.	R-F transmission line to output jack J302

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-420/SRA-14 ANTENNA COUPLER GROUP AN/SRA-14

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
		COUPLER, ANTENNA CU-420/SRA-14: Matches 50-ohm impedance of r-f transmission line; 2 term, input coax type, output ins feed through type; c/o 2 variable capacitors, 3 fixed capacitors, one spiral wound coil, one loop coil, one match indicator; 7-23/32 in. h x 24-3/4 in. wd x 18-13/16 in. d o/a; cabinet mounted, on pull-out slides, forced air cooling; freq range 4 to 12 mc, rated at 500 w; NEMS-CLARKE, Inc. part/dwg #AJ-13,810.	Matches 50-ohm impedance of r-f transmission line
C1		CAPACITOR, FIXED, MICA DIELECTRIC: coml type; .01 μf, ±5%, CM35C103J per MIL-C-5A; 500V dc; Cornell Dubilier type 1DL3S1.	Microammeter M1 bypass
C2		CAPACITOR, FIXED, MICA DIELECTRIC: .0003 μf, 5000 vdc; Sangamo type F2-B; CM70D301G per MIL-C-5A.	Part of impedance matching circuit
C3		CAPACITOR, VARIABLE, VACUUM DIELECTRIC: coml type UCS-Jennings Mfg. Co. 10-300 μμf, 15 KV.	Impedance tuning
C4		CAPACITOR, VARIABLE, AIR DIELECTRIC: plate meshing type; one section; capacity approx 50 μμf minimum, 5000 μμf maximum; straight-line wave length tuning characteristic, 2000 vac peak voltage, no trimmers; shaft adjustment; 180° cw rotation of the gears; 10-1/4 in. lg, over-all, 4-13/16 in. wide, 6-1/4 in. high; NEMS-CLARKE, Inc. part/dwg #AD-13,077-1.	Impedance tuning
C5		CAPACITOR, FIXED, MICA DIELECTRIC: 0.00027 μf, 5000 v; Cornell Dubilier type CM70E-271J; per MIL-C-5A.	Part of impedance matching circuit
C6		Same as C5.	Part of impedance matching circuit
CR1		CRYSTAL UNIT, RECTIFYING: germanium; JAN-1N34A.	Rectifier
DC1	(j)	COUPLER, DIRECTIONAL: assembly consists of a box cover, resistor (R2), capacitor (C1), crystal (CR1), pick up loop, a tube assembly, and a connector receptacle input on one end and a connector receptacle output on the other end, plus an output wire approx 8 in. lg with a metal tubing shield soldered to the box; the box is 6-1/2 in. lg, 3-1/16 in. wd, and 2-1/4 in. high; NEMS-CLARKE, Inc. part/dwg #AC-13,292.	Part of match indicator circuit
E1		INSULATOR, STANDOFF: Silicone glass laminate; 2.031 in. h x 7/8 in. wd x 1 in lg, two #8-32 thd holes x 11/16 in. d each end; NEMS-CLARKE, Inc. part/dwg #A-15,179-1.	Insulators for mounting blocks O48
E2	(j)	ARRESTOR, ELECTRICAL SURGE: air gap type; metal; adjustable 8000 to 10,000v range of breakdown voltages—assembly consists of cap nut, Parker Kalon Corp. #10-24; used as an upper electrode, and a lower electrode which consists of a screw, NEMS-CLARKE, Inc. part/dwg #A-12,778; nut, plain hexagon, NEMS-CLARKE, Inc. part/dwg #A-12,779; and a nut, hexagon, special; NEMS-CLARKE, Inc. part/dwg #A-12,777-2; per NEMS-CLARKE, Inc. part/dwg #AB-13,523.	Spark gap
E3		BAR ASSEMBLY, SHORTING: consists of a shorting bar, NEMS-CLARKE, Inc. part/dwg #A-12,686; and two giant banana plugs #398 Birnbach Radio Co.; assembly dwg. NEMS-CLARKE, Inc. part/dwg #AA-13,311.	Normally clamped to chassis; used to continue operation of coupler group when a drawer chassis is removed
E4		BAR, OUTPUT: brass, silver plate; 1-3/4 in. lg, 9/16 in. sq on face; two mounting holes drill #18 (0.1695) and countersink 82° x 0.336 in. diam; one connector hole drill #43 (0.089) and tap #4-40 through; one hole for mounting plug, drill #3 (0.213) x 5/8 in. d and tap #1/4-28 x 1/2 in. full thd; NEMS-CLARKE, Inc. part/dwg #B-12,692.	Mounts banana plug P1

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-420/SRA-14 ANTENNA COUPLER GROUP AN/SRA-14

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
H1		THUMBSCREW: stainless steel; knurled, med diam; Section B, Reference Drawing Group 29, A-5/8 in., H-1/2 in., L-1-1/8 in.; cone point; #10-32 thd OD; NEMS-CLARKE, Inc. part/dwg #A-12,594.	Fastens drawer chassis to cabinet
H2	(d)	Not Applicable.	Mounts frame O50 on panel
L1		COIL, RADIO FREQUENCY: single layer wound; 11 turns; nilvar rod 0.187 in. diam; silver plate finish; 3-1/16 in. ID of coil loops, 3-7/16 in OD, 7 in. lg; NEMS-CLARKE, Inc. part/dwg #B-12,849 per NEMS-CLARKE, Inc. assembly dwg #AC-13,524.	Part of impedance matching circuit
L2		COIL, RADIO FREQUENCY: one turn; nilvar strip; silver plate; 2.687 in. ID, 0.500 in. wd, 0.062 in. thk; NEMS-CLARKE, Inc. part/dwg #B-12,847.	Coupling loop inside of L1
M1		AMMETER: panel mounted; dc; marked microamperes; 0-to-50 cw; full scale; marked "DC"; Weston Model 301; bakelite case with 1/2 in. studs (MR35W 050 DCUA per MIL-M-6A).	Indicates optimum coupling
M2		COUNTER, ROTATING, FIXED MOUNTING: 4-figure counter; case with flange at window: Veeder Root Series #1141; shaft rotation #4; modified per NEMS-CLARKE, Inc. part/dwg #A-12,721.	Indicates setting of TUNING and COUPLING controls
O-1		SHAFT: R-F coil adjusting; consists of two split contact shaft assemblies/pigtail connectors, one separating insulator and one insulating sleeve; cylindrical; approx 2-1/2 in. lg, 1/2 in. diam, four tapped mounting holes #2-56 thd on 3/16 in. mtg/c; NEMS-CLARKE, Inc. part/dwg #AC-13,274.	Electrically connects coupling coil L2 to banana plug P1
O-2	(b)	SHAFT: R-F coil adjusting; lava #1136; cylindrical; 2-21/64 in. lg, 1/2 in. diam; two tapped mtg. holes #6-32, 1/2 in. d thd; NEMS-CLARKE, Inc. part/dwg #A-12,526.	Mechanically connects coupling coil L2 to worm gear O-3
O-3		GEAR, WORM: concave type; double thread; 48 pitch; 80 teeth; 5/32 in. face; 20° pressure angle; 1.667 in. pitch diam; RH thd; Boston Gear Works part #D-1122 modified; NEMS-CLARKE, Inc. part/dwg #A-12,832.	Actuates coupling coil L2
O-4		WORM: double thd; 9/16 in. face; 0.333 in. pitch diam; 0.1309 in. thd lead; RH thd; 7° 7′ lead angle; 48 pitch; Boston Gear Works part #DSH modified; NEMS-CLARKE, Inc. part/dwg #A-12,822.	Meshes with worm gear O-3
O-5	(g)	BEARING, SLEEVE: brass, nickel plated; 3/4 in. OD, 1/2 in. ID, 1-1/16 in. lg with flange 1-9/16 in. diam 1/8 in. thk 7/32 in. from one end; four tapped #4-40 thd holes; NEMS-CLARKE, Inc. part/dwg #A-12,833.	Bearing for shaft O-2
O-6	(g)	STOP, GEAR: CRS, cad plated; approx 2-1/8 in. diam, 3/32 in. thk; four 1/8 in. diam mounting holes 90° apart on circle 0.625 in. rad; NEMS-CLARKE, Inc. part/dwg #B-12,843.	Mounts on worm gear O-3 to prevent coupling coil L2 from overshooting
O-7	(b)	STOP: assembly consists of a collar 7/16 in. OD by 3/16 in. ID/ #4-40 tapped 0.089 in. diam setscrew hole, 6-0 taper pin hole; half drilled; brass, nickel plated; NEMS-CLARKE, Inc. part/dwg #A-12,839 and a pin 0.078 in. diam, 7/32 in. lg; stainless steel; NEMS-CLARKE, Inc. part/dwg #A-12,835, per assembly dwg NEMS-CLARKE, Inc. part/dwg #A-13,096.	Engages with stop O-6
O-8	(b)	SHAFT: worm drive; stainless steel; 3/16 in. diam by 2-25/32 in. lg with shoulder 1/4 in. diam by 3/4 in. face on one end; NEMS-CLARKE, Inc. part/dwg #A-12,837.	Connects to worm drive O-4

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-420/SRA-14 ANTENNA COUPLER GROUP AN/SRA-14

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O-9	(b)	COLLAR, SHAFT: brass, nickel plated; 3/8 in. OD by 1/4 in. lg with 0.188 in. hole, tapped setscrew hole 0.089 in. diam with #4-40 thd, taper pin hole 0.063 in. diam, half drilled; NEMS-CLARKE, Inc. part/dwg #A-12,834.	Prevents end play of worm-drive shaft O-8
O-10	(b)	BRACKET: square "U" shape; brass, nickel plated; 15/16 in. high by 1/2 in. wide by 1-3/4 in. lg; two 3/16 in. diam mounting holes on 1 in. mtg/c; two shaft holes 0.188 in. diam; NEMS-CLARKE, Inc. part/dwg #A-12,836.	Supports worm-drive shaft O-8
O-11		COUPLING, SHAFT, FLEXIBLE: ceramic; 1 in. OD; 1/4 in. shaft holes; Cardwell Mfg. Co. part #PL5000-A.	Couples dial-drive shaft O-12 to worm-drive shaft O-8
O-12	(b)	SHAFT: dial drive; stanless steel; 1/4 in. diam, 6 in. lg; one end 3/16 in. diam, 1-5/8 in. face; NEMS-CLARKE, Inc. part/dwg #A-12,789.	Connects COUPLING knob to coupling O-11
O-13	(g)	BEARING, SLEEVE: assembly consists of dial drive shaft bearing; brass, nickel plated; 1/2 in. OD, 3/16 in. ID, 3/8 in. lg over-all with 9/16 in. hex flange one end, #1/2-20 thd 1/4 in. d other end; NEMS-CLARKE, Inc. part/dwg #A-12,590-3; lock washer, 1/2 in. internal tooth; phosphor bronze, nickel plated; nut 3/4 in. hex, 1/8 in. thk; brass, nickel plated; NEMS-CLARKE, Inc. part/dwg #A-12,591.	Bearing for dial-drive shaft O-12
O-14	(g)	DIAL: assembly; scale 0 to 10, left to right, in increments of 10; 3-1/4 in. diam, 1/32 in. thk; three knob mounting holes 0.128 in. diam, 120° apart on 15/32 in. rad; black anodize finish; white engraved markings; NEMS-CLARKE, Inc. part/dwg #A-12,588; knob 2-1/4 in. diam, 1-1/16 in. lg; folding handle opens to 4 in. diam; 3/16 in. hole; black anodize finish, fluted; NEMS-CLARKE, Inc. part/dwg #B-12,678-3 per NEMS-CLARKE, Inc. assembly dwg #AC-13,112-3.	Dial assembly for COUPLING control
O-15	(g)	DIAL: assembly; scale 0 to 10, left to right, in increments of 10; 3-1/4 in. diam, 1/32 in. thk; three knob mounting holes 0.128 in. diam 120° apart on 15/32 in. rad; black anodize finish; white engraved markings; NEMS-CLARKE, Inc. part/dwg #A-12,588; knob 2-1/4 in. diam, 1-1/16 in. lg; folding handle opens to 4 in. diam; 3/16 in. hole; black anodize finish; fluted; NEMS-CLARKE, Inc. part/dwg #B-12,678-2 per NEMS-CLARKE, Inc. assembly dwg #AC-13,112-2.	Dial assembly for TUNING control
O-16		GEAR, MITER: straight type; brass; 16 teeth; 1/8 in. face; 1/2 in. pitch diam; 3/16 in. bore; #6-32 tapped setscrew hole, taper pin hole 0.078 in. diam, half drilled; Chicago Gear Work part #M-103; modified per NEMS-CLARKE, Inc. part/dwg #A-13,069-2.	Matched gears connected to dial-drive shaft O-12
O-17		GEAR, MITER: straight type; brass; 18 teeth; 7/64 in. face; 3/8 in. pitch diam; 1/8 in. bore; #6-32 tapped setscrew hole; taper pin hole 0.078 in. diam, half drilled; Boston Gear Works part #G-461; modified per NEMS-CLARKE, Inc. part/dwg #A-13,070.	Matched gears used to drive counter M2 of COUPLING circuit
O-18		COUPLING: Stainless steel; 1-3/8 in. lg x 3/4 in. diam; straight bored 1/2 in. diam shaft hole; three #6-32 tapped setscrew holes 90° apart; taper pin hole #3/0; NEMS-CLARKE, Inc. part/dwg #A-14,473.	Couples vacuum capacitor C3 to helical gear O-20
O-19	(d)	Not Applicable.	Nut for helical-gear drive shafts O-22 and O-23
O-20		GEAR, HELICAL: single helical tooth type; steel; 24 teeth; 1/4 in. face; 14-1/2° press angle; 1 in. pitch diam; 45° helix angle; LH teeth; hardened; 1/2 in. bore; 1/8 in. by 1/16 in. keyway; Boston Gear Works part #H2424-L (24P-1 in. PD) L.H.	Drives vacuum capacitor C3 from shafts O-22 and O-23
O-21		BEARING, BALL: single row annular; double shield; light duty; 3/8 in. bore; 7/8 in. OD, 7/32 in. wd; 7 balls 5/32 in. diam; std slush grease; New Departure part #77-R-6.	Bearings for shafts O-22 and O-23

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-420/SRA-14 ANTENNA COUPLER GROUP AN/SRA-14

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O-22	(b)	SHAFT: helical gear drive; stainless steel, passivate finish; 13/16 in. OD, 2-7/16 in. lg; shaft dimensions thd end 0.375 in. diam, 1.171 in. lg; shaft dimensions other end, 0.500 in. diam, approx 1/2 in. lg; 5/16-24 thd, 0.407 in. lg; 1/8 in. keyway, 0.234 in. lg; NEMS-CLARKE, Inc. part/dwg #A-12,803.	Drives helical gear O-20
O-23	(b)	SHAFT: helical gear drive; stainless steel, passivate finish; 0.375 in. diam, 2-13/32 in. lg, shoulder in center 1/2 in. diam, 1/8 in. keyway; 5/16-24 thd one end approx 5/16 in. lg; other end reduced to 5/16 in. diam approx 5/16 in. lg; NEMS-CLARKE, Inc. part/dwg #A-12,802.	Drives helical gear O-20
O-24	(b)	BUSHING, PLAIN, FLANGED: brass, nickel plated; 1/2 in. OD, 0.375 in. ID, 0.906 in. lg; flange one end 13/16 in. diam, 1/8 in. thk; NEMS-CLARKE, Inc. part/dwg #A-12,805.	Maintains distance between bearings O-21 and helical gear O-20 on shaft O-22
O-25	(b)	BUSHING, PLAIN, FLANGED: brass, nickel plated; 15/32 in. OD, 0.375 in. ID, 0.406 in. lg; flange one end 11/16 in. diam, 1/8 in. thk; NEMS-CLARKE, Inc. part/dwg #A-12,614.	Maintains distance between bearings O-21 and helical gear O-20 on shaft O-23
O-26	(g)	COUPLING: assembly consists of phenolic sleeve 1-3/4 in. lg, 15/32 in. OD with 1 in. wd; 3/4 in OD shoulder in center; 5/16 in. shaft hole; 1 in. lg taper pin and setscrew holes in each end; NEMS-CLARKE, Inc. part/dwg #A-12,688-2; two collars; brass, nickel plated; one each end; 3/4 in. OD, 0.469 in. ID with a #6-32 tapped, setscrew hole and a 0.110 diam taper pin hole, half drilled, at each end; NEMS-CLARKE, Inc. part/dwg #A-12,667 NEMS-CLARKE, Inc. per assembly part/dwg #AA-13,083-2.	Couples helical-gear drive shaft O-23 to worm-gear shaft O-27
O-27		SHAFT, GEAR, WORM: stainless steel; one RH worm; shaft, 5/16 in. diam, 5-11/16 in. lg, ends chamf 1/32 x 45°; worm 13/16 in. lg, pitch diam 0.500 in.; single thd; diametral pitch 48; normal press angle 14-1/2°; normal diam pitch 48.042; helix angle 2° 23′ 8″; 0.5416 in. OD; NEMS-CLARKE, Inc. part/dwg #A-12,442.	Links TUNING dial assembly O-15 with worm gear O-28
O-28		GEAR, WORM: concave type; bronze; 50 teeth; normal pressure angle 14-1/2°; diametral pitch 48; helix angle 2° 23′ 8″; normal diametral pitch 48.042; RH thd; pitch diam 1.0416; 1.0832 throat diam; NEMS-CLARKE, Inc. part/dwg #B-12,443.	Actuates rotor of air-capacitor C4
O-29	(g)	STOP, GEAR: CRS, cad plated; approx 1-1/8 in. diam by 1/16 in. thk; three elongated 1/16 in. diam mounting holes equal distance apart on 5/16 in. rad; shaft hole 0.250 in. diam; NEMS-CLARKE, Inc. part/dwg #B-12,845.	Mounts on worm gear O-28 to prevent overshooting
O-30	(g)	STOP, GEAR: CRS, cad plated; 0.531 in. OD, 0.313 in. ID, 3/8 in. lg; RH stopping cam; one #6-32 tapped 0.106 in. setscrew hole, and one taper pin hole, drill #47 (0.078), 90° apart; NEMS-CLARKE, Inc. part/dwg #A-12,818.	Mounts on worm-gear shaft O-27 to prevent overshooting
O-31	(g)	STOP GEAR: CRS, cad plated; 0.531 in. OD, 0.313 in. ID, 3/8 in. lg; LH stopping cam; one #6-32 tapped 0.106 in. setscrew hole, and one taper pin hole, drill #47 (0.078), 90° apart; NEMS-CLARKE, Inc. part/dwg #A-12,809.	Mounts on worm-gear shaft O-27 to prevent overshooting
O-32	(b)	BRACKET: bearing mount, worm shaft support; aluminum alloy, alodine finish; 1-1/8 in. wd, 1-1/2 in. high, 2-7/8 in. lg; four 3/16 in. diam mounting holes; two 1/8 in. diam centering holes; one bearing press fitted into 23/32 in. hole on each end; Fafnir Corp. #F-5; NEMS-CLARKE, Inc. part/dwg #B-12,850.	Bearing mount for worm-gear shaft O-27
O-33	(b)	COLLAR: brass; nickel plate; 9/16 in. OD, 0.312 in. ID with a #6-32 tapped, setscrew hole and a 0.078 in. diam taper pin hole 90° apart; NEMS-CLARKE, Inc. part/dwg #A-12,816.	Locks worm-gear shaft O-27 in place inside worm-shaft support bracket O-32

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-420/SRA-14 ANTENNA COUPLER GROUP AN/SRA-14

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O-34	(g)	COUPLING: assembly consists of a phenolic sleeve 1 in. lg, 15/32 in. OD, 1/4 in. wd, 3/4 in. OD shoulder in center, 5/16 in. shaft hole; 1 in. lg taper pin and setscrew holes in each end; NEMS-CLARKE, Inc. part/dwg #A-12,668-1; and two collars; brass, nickel plated; one each end; 3/4 in. OD, 0.469 in. ID, #6-32 tapped, setscrew hole and 0.110 in. diam taper pin hole, half drilled at each end; NEMS-CLARKE, Inc. part/dwg #A-12,667; per NEMS-CLARKE, Inc. assembly part/dwg #AA-13,083-1.	Couples worm-gear shaft O-27 with TUNING drive shaft O-55
O-35	(g)	BEARING, SLEEVE: assembly consisting of dial drive shaft bearing; brass, nickel plated; 1/2 in. OD, 5/16 in. ID, 3/8 in. lg over-all, 9/16 in. hex flange one end: #1/2-20 thd, 1/4 in. d other end; NEMS-CLARKE, Inc. part/dwg #A-12,590-2; lock washer, 1/2 in. internal tooth; phosphor bronze, nickel plated; nut 3/4 in. hex, 1/8 in. thk; brass nickel plated; NEMS-CLARKE, Inc. part/dwg #A-12,591.	Bearing for TUNING dial-drive shaft O-55
O-36		GEAR, BEVEL: straight type; brass; 32 teeth; 5/32 in. face; 1 in. pitch diam; tapped #6-32 thd setscrew hole, #36 taper pin hole, 90° apart; 5/16 in. diam bore; 11/32 in. backing; Chicago Gear Works part #B-119 modified; NEMS-CLARKE, Inc. part/dwg #A-13,088-1.	Matched bevel gear for counter drive shaft O-56 of TUNING control
O-37		GEAR, BEVEL: straight type; brass; 16 teeth; 5/32 in. face; 1/2 in. pitch diam; tapped #6-32 thd setscrew hole, #36 taper pin hole, 90° apart; 3/8 in. diam bore; 7/32 in. backing; Chicago Gear Works part #B-119 modified; NEMS-CLARKE, Inc. part/dwg #A-13,088-2.	Matched bevel gear for counter drive shaft O-56 of TUNING control
O-38		GEAR, BEVEL: straight type; brass; 18 teeth; 1/8 in. face; 3/8 in. pitch diam, two tapped #4-40 thd setscrew holes, 90° apart; 1/8 in. bore; 7/32 in. backing; Chicago Gear Works part #B-117 modified; NEMS-CLARKE, Inc. part/dwg #A-13,089-2.	Matched bevel gear for driving counter M2 of TUNING control
O-39		GEAR, BEVEL: straight type; brass; 36 teeth; 1/8 in. face; 3/4 in. pitch diam; 2 tapped #4-40 thd setscrew holes, 90° apart; 1/8 in. bore; 1/4 in. backing; Chicago Gear Works part #B-117 modified; NEMS-CLARKE, Inc. part/dwg #A-13,089-1.	Matched bevel gear for driving counter M2 of TUNING control
O-40		CLAMP, ELECTRICAL: dial locking assembly, consisting of a knob, spacer, pivot guide, pin, special washers, and associated hardware; NEMS-CLARKE, Inc. part/dwg #AB-13,111.	Locking assembly for COUPLING dial O-14 and TUNING dial O-15
O-41	(b)	BLOCK, BEARING: brass, nickel plated; height 11/16 in., base 1-3/8 in. by 1 in., including 1/4 in. flange with 4 tapped mounting holes #43, 0.089 in. drill #4-40 thd, 1 inch c to c; bearing hole 0.187 in. diam 0.406 in. from base, runs the length of the block; NEMS-CLARKE, Inc. part/dwg #A-12,729.	Bearing block for counter-drive shaft O-42
O-42	(b)	SHAFT: counter drive; stainless steel; 5/16 in. OD, 2-11/16 in. lg; section 1-7/8 in. lg has 3/16 in. diam, section 11/16 lg has 1/8 in. diam; ring 3/16 in. lg has 5/16 diam; NEMS-CLARKE, Inc. part/dwg #A-12,730.	Counter-drive shaft for COUPLING circuit
O-43	(g)	CLAMP: Electrical; brass, silver plated; formed strip 1-1/8 in. radius, with tabs mounted on a U shaped bracket 1/8 in. thk with 11/32 in. hole in c; NEMS-CLARKE, Inc. part/dwg #AA-15,161.	Clips for holding vacuum capacitor C3
O-44	(g)	CLAMP: Holding; brass, silver plated; formed strip 7/16 in. wd x 1/8 in. thk; NEMS-CLARKE, Inc. part/dwg #A-15,159-2.	Locks clips O-43
O-45	(g)	CLIP: retaining; phosphor bronze, nickel plated; 1-3/8 in. lg, 3/4 in. wd, 3/4 in. high; two 5/16 in. sq tabs for securing clip to chassis; NEMS-CLARKE, Inc. part/dwg #A-12,688.	Holds shorting bar assembly E3
O-46	(g)	CLIP: locking; phosphor bronze, nickel plated; 3/4 in. lg, 3/4 in. wd, 0.032 in. thk; NEMS-CLARKE, Inc. part/dwg #A-12,687.	Locks clip O-45

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-420/SRA-14 ANTENNA COUPLER GROUP AN/SRA-14

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O-47	(g)	BUSHING: reducing fitting; brass, silver plated; 1-1/2 in. lg, 1-1/2 in. OD, 1-5/16 in. ID, 3/32 in. thk; tubing; NEMS-CLARKE, Inc. part/dwg #A-12,804.	Reducing fitting for thimble of vacuum capacitor C3
O-48	(b)	MOUNTING: block; silicone glass laminate; 3-1/2 in. lg, 3/4 in. wd, 3/4 in. high; two end mounting holes, drill #4 (0.209) and center bore 3/8 in. diam by 1/4 d; two holes 1/2 in. from center, drill 3/16 in. (0.187) diam; one center hole drill 7/32 in. diam; NEMS-CLARKE, Inc. part/dwg #A-12,782.	Mounting block for vacuum capacitor C3
O-49	(b)	HOLDER, WRENCH: No. 3; full size, bronze; connector wire; Fahnstock Electric Co. nomenclature.	Mounts #4, #6 and #8 Allen wrenches
O-50	(d)	Not Applicable.	Holder for calibration chart
O-51	(b)	WINDOW: lucite, clear; 3-7/8 in. lg, 2-9/16 in. wd; 1/32 in. thk; purchased from Colonial Kalomite Co.; NEMS-CLARKE, Inc. part/dwg #A-12,616.	Cover for calibration chart
O-52	(g)	FASTENER, LATCH: safety catch assembly, consisting of an assembly stop, arm, bearing, stop, screw, spring posts and associated hardware; NEMS-CLARKE, Inc. part/dwg #AB-13,276.	Safety catch assembly for drawer chassis
O-53	(g)	BUSHING, PLAIN, FLANGED: shape style No. 2A, section A, 11 Ref Dwg Group 191; aluminum alloy; 1.126 in. OD, 0.7812 in. ID, 0.25 in. thk; NEMS-CLARKE, Inc. part/dwg #A-12,801.	Busing for helical-gear drive shaft O-23
O-54	(g)	GUIDE, DRAWER: stainless steel; one end flanged; flange flattened on two sides; 1-1/4 in. lg, 7/8 in. max OD flange, 3/4 in. wd flat side of flange; external thd #5/8-24; center hole 0.313 in. diam, with flange end chamf 1/16 x 30°; NEMS-CLARKE, Inc. part/dwg #A-12,584.	Receives drawer - chassis guide pin O-304
O-55	(b)	SHAFT: stainless steel, passivate finish; 5/16 in. OD, 2-7/8 in. lg; 7/16 in. lg keyway 1/32 in. d with a 1/32 in. rad; 1/32 x 45° chamf both ends; NEMS-CLARKE, Inc. part/dwg #A-12,799.	Drive shaft for TUNING control
O-56	(b)	SHAFT: stainless steel; passivate finish; 5/16 in. max OD, 2-1/2 in. lg; 5/16 in. diam collar 1/8 in. lg with one side chamf 1/64 x 30°, 1-5/16 in. from one end; shank 1-5/16 in. lg has 0.186 in. diam; other end 1-1/16 in. lg section 1/8 diam; both ends of shaft are chamf 1/64 x 45°; NEMS-CLARKE, Inc. part/dwg #A-13,410.	Counter-drive shaft for TUNING control
O-57	(b)	BLOCK, BEARING: for counter drive shaft; brass nickel plated; height 11/16 in., base 1 in. x 7/8 in. including 1/4 in. flange each side of broad dimension; two mounting holes in each flange, #43 (0.089) drill and tap #4-40, 1/2 in. c to c; bearing hole 0.187 in. diam 0.406 in. from base, runs length of the block; NEMS-CLARKE, Inc. part/dwg #A-13,413.	Bearing block for counter-drive shaft O-56
P1		CONNECTOR, PLUG: giant banana plug #398 Birnbach Radio Co.	Connects coupler to receptacle J301
P2		CONNECTOR, PLUG: UG-21B/U, per Navy Dwg RE49F402.	Used on cable W1 to connect directional coupler DC1 to air-dielectric capacitor C4
R1		RESISTOR, FIXED, COMPOSITION: body style No. 14, Ref Dwg Group 2; 68,000 ohms total resistance; ±10% tolerance; 1/2w; Allen-Bradley.	Used with sensitivity switch S1
R2		RESISTOR, FIXED, COMPOSITION: 110 ohms total resistance; ±5% tolerance; 2w; Allen-Bradley.	Limiting resistor
S1		SWITCH, TOGGLE: SPST; 2 positions; Arrow Hart and Hegeman; ST12A per JAN-S-23 spec.	Sensitivity switch for meter S1
W1	(j)	CABLE, SPECIAL PURPOSE, ELECTRICAL: assembly consists of connector UG-21B/U; coaxial cable RG-8/U, 12-7/8 in. lg; ground strap soldered to one end and lug soldered to conductor at the same end, NEMS-CLARKE, Inc. part/dwg #AA-13,308-1.	Connects directional coupler DC1 to air-dielectric capacitor C4

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

FUSE PANEL SB-406/SRA ANTENNA COUPLER GROUP AN/SRA-14

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
		PANEL, FUSE SB-406/SRA: Contains four fuses, indicator lamp, connector and receptacle; 11-7/32 in. h x 24-3/4 in. wd x 10-3/8 in. d; cabinet mounted, on pull-out slides; NEMS-CLARKE, Inc. part/dwg #AF-13,776.	Mounts components for protecting blower assembly
E201		CLAMP, ELECTRICAL: cable clamp; AN3057-6 Amphenol.	Clamps power cable on P201
F201		FUSE, CARTRIDGE: Navy type 28032-3; 3 amp; blowing time, life at 110%, 1 hr at 135%, 5-6 sec at 200% load; 250V; one time; glass body; ferrule term; 1-1/4 in. lg x 1/4 in. diam at each end; Littelfuse (LTF) type 3AG, part #1043.	A-C line
F202		Same as F201.	A-C line
XF201		FUSE HOLDER: in-the-line type; 250V, 3 amp; two holders are for one line fuse each; two holders are for one spare fuse each; coml. H.K.P. Bussman Mfg. Co.	Holder for line and spare fuses
I-201		LAMP, INCANDESCENT: double contact, bayonet type; replaceable from the front of the cabinet; 120V, 6w; 6S6 DC General Electric.	Signal lamp to indicate blower unit is operating
J201		CONNECTOR, RECEPTACLE: AN3102A-14S-7P Amphenol.	Power input receptacle
P201		CONNECTOR, PLUG: 90° angle plug; AN-3108B-14S-7S Amphenol.	Power input plug
XI-201	(g)	LAMPHOLDER: part of assembly LH63BG2 per MIL-L-3661, per Dial Light Corp. #51202-112; the lampholder carries the catalog #51202-1 Dial Light Corp.	Holder for lamp I-201 and lens XI-202
XI-202		LENS, INDICATOR LIGHT: includes lensholder; catalog #51-112 Dial Light Corp.	Lens for lamp I-201

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ELECTRICAL EQUIPMENT CABINET CY-1670/SRA — ANTENNA COUPLER GROUP AN/SRA-14

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
		CABINET, ELECTRICAL EQUIPMENT CY-1670/SRA: Contains four antenna couplers, a fuse panel, blower assembly, vertical coaxial tube, and air ducts; 46-3/4 in. h x 26-1/4 in. wd x 20-1/2 in. d; NEMS-CLARKE, Inc. part/dwg #AC-13,050.	Contains major units and assemblies of Coupler Group, Antenna AN/SRA-14
B301		MOTOR, ALTERNATING CURRENT: dual voltage; 115/230V ac; model DRCP, type KS-505-CCW, series 153 BS Rotron Mfg. Co.	Motor for blower unit
C301		CAPACITOR, FIXED, PAPER DIELECTRIC: 3μf; 220V R.B.F. #701 Aerovox.	Motor starting capacitor
E301	(g)	BLOCK, CONTACT: brass, silver-plate finish; 2 in. lg, 3/4 in sq; two mounting holes, drill #17 (0.173 diam); end hole for jack, drill #39/64 (0.453) and tap #1/2-20 x 7/8 d; center bore 17/32 x 1/16 in. d; NEMS-CLARKE, Inc. part/dwg #A-12,685.	Holder for J301 (8 per set)
E302		INSULATOR, RING: lava, grade "A", white; dimensions Ref Dwg. Group 9, item code No. 90, D-5/8 in. F-0.561 in. H-0.25 in., L-3/8 in., E-3/16 in.; NEMS-CLARKE, Inc. part/dwg #A-12,524.	For bracing as well as insulating conductor rod in r-f transmission line W301 (5 per set)
E303		INSULATOR, RING: lava, grade "A", white; dimensions 0.561 in. OD 0.250 in. ID, 3/8 in. thk, shoulder; per NEMS-CLARKE, Inc. part/dwg #A-12,525.	For bracing as well as insulating one end of conductor rod of r-f transmission line W301 (1 per set)
FL301		FILTER, AIR CONDITIONING: fiberglas; 10 in. by 10 in. by 1 in.; Owens Corning Corp.	Filter for blower unit (2 per set)
J301		CONNECTOR, RECEPTACLE: giant jack; #399 Birnbach Radio Co.	Receptacle for banana plug J1 (8 per set)
J302		CONNECTOR, RECEPTACLE: UG-352A/U; per Navy dwg RE49F509.	Output jack (to antenna)
O-301	(d)	Not Applicable.	Lifting ring (4 per set)
O-302	(b)	MOUNTING: block; silicone glass laminated; 2-1/4 in. lg, 2 in. wd, 7/8 in. thk; 4 mounting holes, drill #7 (0.201) and tap #1/4-20 through, center bore 0.328 in. diam x 7/64 (0.109) in. d; four rosan inserts (cat. #R104SB-6) in. mounting holes and two rosan inserts (cat. #R106SB-8) in holes for jack holder, these two holes are 5/16 in. (0.312) diam drill and tap #3/8-16 through center bore 0.437 in. diam x 5/32 in. (0.156) d; NEMS-CLARKE, Inc. part/dwg #B-12,689.	Mounts contact blocks E301 (4 per set)
O-303	(b)	MOUNTING: block; stainless steel; 1/2 in. diam, 5/16 in. thk; center hole drill "F" (0.257) diam and tap #5/16-18 thd; three mounting holes 120° apart on 19/32 in. rad drill #36 (0.106) diam and tap #6-32 thd; NEMS-CLARKE, Inc. part/dwg #A-12,581-2.	Mounts guide pin O-304 (4 per set)
O-304	(b)	PIN, STRAIGHT, HEADED: stainless steel, passivate finish; 1-15/16 in. over-all length; shank end 1-1/2 in. lg. 0.312 in. diam, end pointed 1/32 in. rad 30°; square collar 5/16 in. from other end 1/8 in. thk, 3/4 in. on a side, corners rounded on a 7/16 in. rad; end section 5/16 in. lg, threaded 5/16-18; NEMS-CLARKE, Inc. part/dwg #A-13,516.	Aligns drawer chassis in cabinet (4 per set)
TB301		STRIP, TERMINAL: general-purpose terminal strip; 4 double screw type terminals; bakelite; 3-1/4 in. lg x 1-9/32 in. wd x 5/8 in. thk; Howard B. Jones Division of Cinch Man. Corp. part #4-142.	Connections for input power
W301	(g)	LINE, RADIO FREQUENCY TRANSMISSION: coaxial type; 50 ohms characteristic impedance; line has three inner line conductors; brass, silver plated, 0.250 in. diam, 6-9/16 in. lg; outer conductor, 5/8 in. OD, 9/16 in. ID, brass telescopic tubing, silver plated; NEMS-CLARKE, Inc. part/dwg #AB-12,550.	R-F transmission line to output jack J302

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-421/SRA-15 ANTENNA COUPLER GROUP AN/SRA-15

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
		COUPLER, ANTENNA CU-421/SRA-15: Matches 50-ohm impedance of r-f transmission line; 2 term, input coax type, output ins feed through type; c/o 2 variable capacitors, 2 fixed capacitors, one spiral wound coil, one loop coil, one directional coupler, one match indicator; 7-23/32" h x 24-3/4" wd x 18-3/16" d o/a; cabinet mounted on pull-out slides, forced air cooling; freq range 6 to 16 mc, rated as 500 w; NEMS-CLARKE, Inc. part/dwg #AJ-13,810.	Matches 50-ohm impedance of r-f transmission line
C1		CAPACITOR, FIXED, MICA DIELECTRIC: .01 μf, ±5%; CM35C103J per MIL-C5A; 500V dc; Cornell Dubilier type 1DL3S1.	Part of directional coupler DC1
C2		CAPACITOR, FIXED, MICA DIELECTRIC: 0.00015 μμf, 5000V dc, Cornell Dubilier CM70E-151J; per MIL-C-5A.	Part of impedance matching circuit
C3		CAPACITOR, VARIABLE, VACUUM DIELECTRIC: coml type UCS-Jennings Mfg. Co. 10-300 μμf, 15 KV.	Impedance tuning
C4		CAPACITOR, VARIABLE, AIR DIELECTRIC: plate meshing type; one section; capacity approx 50 μμf minimum, 5000μμf maximum; straight-line wave length tuning characteristic, 2000V a-c peak voltage, no trimmers; shaft adjustment; 180° cw rotation of the gears; 10-1/4 in. lg. over-all, 4-13/16 in. wd, 6-1/4 in. high; NEMS-CLARKE, Inc. part/dwg #AD-13,077-2.	Impedance tuning
C5		Same as C2.	Part of impedance matching circuit
CR1		CRYSTAL UNIT, RECTIFYING: germanium; JAN-1N34A.	Rectifier
DC1	(j)	COUPLER, DIRECTIONAL: assembly consists of a box, cover, resistor (R2), capacitor (C1), crystal (CR1), pick up loop, a tube assembly, and a connector receptacle input on one end and a connector receptacle output on the other end, plus an output wire approx 8 in. lg with a metal tubing shield soldered to the box; the box is 6-1/2 in. lg, 3-1/16 in. wd, and 2-1/4 in. high; NEMS-CLARKE, Inc. part/dwg #AC-13,292.	Part of match indicator circuit
E1		INSULATOR, STANDOFF: Silicone glass laminate; 2.031" h x 7/8" wd x 1" lg, two #8-32 thd holes x 11/16" d each end; NEMS-CLARKE, Inc. part/dwg #A-15,179-1.	Insulators for mounting blocks O-48
E2	(g)	ARRESTOR, ELECTRICAL SURGE: air gap type; metal; adjustable 8000 to 10,000V range of breakdown voltages—assembly consists of cap nut, Parker Kalon Corp. #10-24; used as an upper electrode, and a lower electrode which consists of a screw, NEMS-CLARKE, Inc. part/dwg #A-12,778; nut, plain hexagon, NEMS-CLARKE, Inc. part/dwg #A-12,779; and a nut, hexagon, special; NEMS-CLARKE, Inc. part/dwg #A-12,777-2 per NEMS-CLARKE, Inc. part/dwg #AB-13,523.	Spark gap
E3		BAR ASSEMBLY, SHORTING: consists of a shorting bar, NEMS-CLARKE, Inc. part/dwg #A-12,686; and two giant banana plugs #398 Birnbach Radio Co.; assembly dwg. NEMS-CLARKE, Inc. part/dwg #AA-13,311.	Normally clamped to chassis, used to continue operation of coupler group when a drawer chassis is removed
E4		BAR, OUTPUT: brass, silver plate; 1-3/4 in. lg, 9/16 in. x 9/16 in. on face; two mounting holes drill #18 (0.1695) and countersink 82° x 0.336 in. diam; one connector hole drill #43 (0.089) and tap #4-40 through; one hole for mounting plug, drill #3 (0.213) x 5/8 in. d and tap #1/4-28 x 1/2 full thd; NEMS-CLARKE, Inc. part/dwg #B-12,692.	Mounts banana plug P1

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-421/SRA-15 ANTENNA COUPLER GROUP AN/SRA-15

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
H1		THUMBSCREW: stainless steel; knurled, med diam; Section B, Reference Drawing Group 29, A-5/8 in., H-1/2 in., L-1-1/8 in.; cone point; #10-32 thd OD; NEMS-CLARKE, Inc. part/dwg #A-12,594.	Fastens drawer chassis to cabinet
H2	(d)	Not Applicable.	Mounts frame O-50 on panel
L1		COIL, RADIO FREQUENCY: single layer wound; 6 turns; nilvar rod 0.187 in. diam; silver plate finish; 3-1/16 in. ID of coil loops, 3-7/16 in. OD, 7 in. lg; NEMS-CLARKE, Inc. part/dwg #B-12,862 per NEMS-CLARKE, Inc. assembly dwg #AC-13,524.	Part of impedance matching circuit
L2		COIL, RADIO FREQUENCY: one turn; nilvar strip; silver plate; 2.687 in. ID, 0.500 in. wd, 0.062 in. thk; NEMS-CLARKE, Inc. part/dwg #B-12,847.	Coupling loop inside of L1
M1		AMMETER: panel mounted; dc; marked microamperes; 0-to-50 cw; full scale; marked "DC", Western Model 301; bakelite case with 1/2 in. studs (MR35W 050 DCUA per MIL-M-6A).	Indicates optimum coupling
M2		COUNTER, ROTATING, FIXED MOUNTING: 4-figure counter; case with flange at window; Veeder Root Series #1141; shaft rotation #4; modified per NEMS-CLARKE, Inc. part/dwg #A-12,721.	Indicates setting of TUNING and COUPLING controls
O-1		SHAFT: R-F coil adjusting; consists of two split contact shaft assemblies/pigtail connectors, one separating insulator and one insulating sleeve; cylindrical; approx 2-1/2 in. lg, 1/2 in. diam, four tapped mounting holes #2-56 thd on 3/16 in. mtg/c; NEMS-CLARKE, Inc. part/dwg #AC-13,274.	Electrically connects coupling coil L2 to banana plug P1
O-2	(b)	SHAFT: R-F coil adjusting; lava #1136; cylindrical; 2-21/64 in. lg, 1/2 in. diam; two tapped mtg holes #6-32, 1/2 in. d thd; NEMS-CLARKE, Inc. part/dwg #A-12,526.	Mechanically connects coupling coil L2 to worm gear O-3
O-3		GEAR, WORM: concave type, double thd; 48 pitch; 80 teeth; 5/32 in. face; 20° pressure angle; 1.667 in. pitch diam; RH thd; Boston Gear Works part #D-1122 modified; NEMS-CLARKE, Inc. part/dwg #A-12,832.	Actuates coupling coil L2
O-4		WORM: double thd; 9/16 in. face; 0.333 in. pitch diam; 0.1309 in. thd lead; RH thd; 7° 7′ lead angle; 48 pitch; Boston Gear Works part #DSH modified; NEMS-CLARKE, Inc. part/dwg #A-12,822.	Meshes with worm gear O-3
O-5	(g)	BEARING, SLEEVE: brass, nickel plated; 3/4 in. OD, 1/2 in. ID, 1-1/16 in. lg with flange 1-9/16 in. diam 1/8 in. thk 7/32 in. from one end; four tapped #4-40 thd holes; NEMS-CLARKE, Inc. part/dwg #A-12,833.	Bearing for shaft O-2
O-6	(g)	STOP, GEAR: CRS, cad plated; 2-1/8 in. diam by 0.093 in. thk; SAE 1020; four mounting holes #30 (0.128) drill spaced 90° apart on 5/8 in. rad; shaft hole 0.750 in. diam; NEMS-CLARKE, Inc. part/dwg #B-12,859.	Mounts on worm gear O-3 to prevent coupling coil L2 from overshooting
O-7	(b)	STOP: assembly consists of a collar 7/16 in. OD by 3/16 in. ID/ #4-40 tapped 0.089 in. diam setscrew hole, 6-0 taper pin hole; half drilled; brass, nickel plated; NEMS-CLARKE, Inc. part/dwg #A-12,839 and a pin 0.078 in. diam, 7/32 in. lg; stainless steel; NEMS-CLARKE, Inc. part/dwg #A-12,835 per NEMS-CLARKE, Inc. assembly dwg #AA-13,096.	Engages with stop O-6
O-8	(b)	SHAFT: worm drive; stainless steel; 3/16 in. diam by 2-25/32 in. lg with shoulder 1/4 in. diam by 3/4 in. face on one end; NEMS-CLARKE, Inc. part/dwg #A-12,837.	Connects to worm drive O-4

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-421/SRA-15 ANTENNA COUPLER GROUP AN/SRA-15

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O-9	(b)	COLLAR, SHAFT: brass, nickel plated; 3/8 in. OD by 1/4 in. lg with 0.188 in. hole, tapped setscrew hole 0.089 in. diam with #4-40 thd, taper pin hole 0.063 in. diam, half drilled; NEMS-CLARKE, Inc. part/dwg #A-12,834.	Prevents any play of worm-drive shaft O-8
O-10	(b)	BRACKET: square "U" shape, brass, nickel plated; 15/16 in. high by 1/2 in. wide by 1-3/4 in. lg; two 3/16 in. diam mounting holes on 1 in. mtg/c; two shaft holes 0.188 in. diam; NEMS-CLARKE, Inc. part/dwg #A-12,836.	Supports worm-drive shaft O-8
O-11		COUPLING, SHAFT, FLEXIBLE: ceramic; 1 in. OD; 1/4 in. shaft holes; Cardwell Mfg. Co. part #PL5000-A.	Couples dial-drive shaft O-12 to worm-drive shaft O-8
O-12	(b)	SHAFT: dial drive; stainless steel; 1/4 in. diam, 6 in. lg; one end 3/16 in. diam, 1-5/8 in. face; NEMS-CLARKE, Inc. part/dwg #A-12,789.	Connects COUPLING knob to coupling O-11
O-13	(g)	BEARING, SLEEVE: assembly consists of dial drive shaft bearing; brass, nickel plated; 1/2 in. OD, 3/16 in. ID, 3/8 in. lg over-all with 9/16 in. hex flange one end, #1/2-20 thd 1/4 in. d other end; NEMS-CLARKE, Inc. part/dwg #A-12,590-3; lock washer, 1/2 in. internal tooth; phosphor bronze, nickel plated; nut 3/4 in. hex, 1/8 in. thk; brass, nickel plated; NEMS-CLARKE, Inc. part/dwg #A-12,591.	Bearing for dial-drive shaft O-12
O-14	(g)	DIAL: assembly; scale 0 to 10, left to right, in increments of 10; 3-1/4 in. diam, 1/32 in. thk; three knob mounting holes 0.128 in. diam, 120° apart on 15/32 in. rad; black anodize finish; white engraved markings; NEMS-CLARKE, Inc. part/dwg #A-12,588; knob 2-1/4 in. diam, 1-1/16 in. lg; folding handle opens to 4 in. diam; 3/16 in. hole; black anodize finish, fluted; NEMS-CLARKE, Inc. part/dwg #B-12,678-3 per NEMS-CLARKE, Inc. assembly dwg #AC-13,112-3.	Dial assembly for COUPLING control
O-15	(g)	DIAL: assembly; scale 0 to 10, left to right, in increments of 10; 3-1/4 in. diam, 1/32 in. thk; three knob mounting holes 0.128 in. diam, 120° apart on 15/32 in. rad; black anodize finish; white engraved markings; NEMS-CLARKE, Inc. part/dwg #A-12,588 knob; 2-1/4 in. diam, 1-1/16 in. lg; folding handle opens to 4 in. diam; 3/16 in. hole; black anodize finish; fluted; NEMS-CLARKE part/dwg #B-12,678-2 per NEMS-CLARKE, Inc. assembly dwg #AC-13,112-2.	Dial assembly for TUNING control
O-16		GEAR, MITER: straight type; brass; 16 teeth; 1/8 in. face; 1/2 in. pitch diam; 3/16 in. bore; #6-32 tapped setscrew hole, taper pin hole 0.078 in. diam, half drilled; Chicago Gear Works part #M-103; modified per NEMS-CLARKE, Inc. part/dwg #A-13,069-2.	Matched gears connected to dial-drive shaft O-12
O-17		GEAR MITER: straight type; brass; 18 teeth; 7/64 in. face; 3/8 in. pitch diam; 1/8 in. bore; #6-32 tapped setscrew hole; taper pin hole 0.078 in. diam, half drilled; Boston Gear Works part #G-461; modified per NEMS-CLARKE, Inc. part/dwg #A-13,070.	Matched gears used to drive counter M2 of COUPLING control
O-18		COUPLING: Stainless steel; 1-3/8" lg by 3/4" diam; straight bored 1/2" diam shaft hole; three #6-32 tapped setscrew holes 90° apart; taper pin hole #3/0; NEMS-CLARKE, Inc. part/dwg #A-14,473.	Couples vacuum capacitor C3 to helical gear O-20
O-19	(d)	Not Applicable.	Nut for helical-gear drive shafts O-22 and O-23
O-20		GEAR, HELICAL: single helical tooth type; steel; 24 teeth; 1/4 in. face; 14-1/2° press angle; 1 in. pitch diam; 45° helix angle; LH teeth; hardened; 1/2 in. bore; 1/8 in. by 1/16 in. keyway; Boston Gear Works part #H2424-L (24P-1 in. PD) L. H.	Drives vacuum capacitor C3 from shaft O-22 and O-23

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-421/SRA-15 ANTENNA COUPLER GROUP AN/SRA-15

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O-21		BEARING, BALL: single row annular; double shield; light duty; 3/8 in. bore; 7/8 in. OD, 7/32 in. wd; 7 balls 5/32 in. diam; std slush grease; New Departure part #77-R-6.	Bearings for shafts O-22 and O-23
O-22	(b)	SHAFT: helical gear drive; stainless steel, passivate finish; 13/16 in. OD, 2-7/16 in. lg; shaft dimensions thd end 0.375 in. diam, 1.171 in. lg; shaft dimensions other end, 0.500 in. diam, approx 1/2 in. lg; 5/16-24 thd, 0.407 in. lg; 1/8 in. keyway, 0.234 in. lg; NEMS-CLARKE, Inc. part/dwg #A-12,803.	Drives helical gear O-20
O-23	(b)	SHAFT: helical gear drive; stainless steel, passivate finish; 0.375 in. diam, 2-13/32 in. lg, shoulder in center 1/2 in. diam, 1/8 in. keyway; 5/16-24 thd one end approx 5/16 in. lg; other end reduced to 5/16 in. diam approx 5/16 in. lg; NEMS-CLARKE, Inc. part/dwg #A-12,802.	Drives helical gear O-20
O-24	(b)	BUSHING, PLAIN, FLANGED: brass, nickel plated; 1/2 in. OD, 0.375 in. ID, 0.906 in. lg; flange one end 13/16 in. diam, 1/8 in. thk; NEMS-CLARKE, Inc. part/dwg #A-12,805.	Maintains distance between bearings O-21 and helical gear O-20 on shaft O-22
O-25	(b)	BUSHING, PLAIN, FLANGED: brass, nickel plated; 15/32 in. OD, 0.375 in. ID, 0.406 in. lg; flange one end 11/16 in. diam, 1/8 in. thk; NEMS-CLARKE, Inc. part/dwg #A-12,614.	Maintains distance between bearings O-21 and helical gear O-20 on shaft O-23
O-26	(g)	COUPLING: assembly consists of phenolic sleeve 1-3/4 in. lg, 15/32 in. OD with 1/4 in. wd; 3/4 in. OD shoulder in center; 5/16 in. shaft hole; 1 in. lg taper pin and setscrew holes in each end; NEMS-CLARKE, Inc. part/dwg #A-12,668-2; two collars; brass, nickel plated; one each end; 3/4 in. OD, 0.469 in. ID with a #6-32 tapped, setscrew hole and a 0.110 diam taper pin hole, half drilled, at each end; NEMS-CLARKE, Inc. part/dwg #A-12,667 per NEMS-CLARKE, Inc. assembly dwg part/dwg #AA-13,083-2.	Couples helical-gear drive shaft O-23 to worm-gear shaft O-27
O-27		SHAFT, GEAR, WORM: stainless steel; one RH worm; shaft, 5/16 in. diam, 5-11/16 in. lg, ends chamf 1/32 x 45°; worm 13/16 in. lg, pitch diam 0.500 in.; single thd; diametral pitch 48; normal press angle 14-1/2°; normal diametral pitch 48.042; helix angle 2° 23′ 8″; 0.5416 in. OD; NEMS-CLARKE, Inc. part/dwg #A-12,442.	Links TUNING dial assembly O-15 with worm gear O-28
O-28		GEAR, WORM: concave type; bronze; 55 teeth; normal pressure angle 14-1/2°; diametral pitch 48; helix angle 2° 23′ 8″; normal diametral pitch 48.042; RH thd pitch diam 1.146; 1.188 outside diam; NEMS-CLARKE, Inc. part/dwg #B-12,444.	Actuates rotor of air-capacitor C4
O-29	(g)	STOP, GEAR: CRS, cad plated; 1.524 in. diam by 1/16 in. thk; three elongated 1/8 in. diam mounting holes on a 5/8 in. rad; shaft hole 0.250 in. diam; NEMS-CLARKE, Inc. part/dwg #B-12,860.	Mounts on worm gear O-28 to prevent overshooting
O-30	(g)	STOP, GEAR: CRS, cad plated; 0.531 in OD, 0.313 in. ID, 3/8 in. lg; RH stopping cam; one #6-32 tapped 0.106 in. setscrew hole, and one taper pin hole, drill #47 (0.078), 90° apart; NEMS-CLARKE, Inc. part/dwg #A-12,818.	Mounts on worm-gear shaft O-27 to prevent overshooting
O-31	(g)	STOP, GEAR: CRS, cad plated; 0.531 in. OD, 0.313 in. ID, 3/8 in. lg; LH stopping cam; one #6-32 tapped 0.106 in. setscrew hole, and one taper pin hole, drill #47 (0.078) 90° apart; NEMS-CLARKE, Inc. part/dwg #A-12,809.	Mounts on worm-gear shaft O-27 to prevent overshooting

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-421/SRA-15 ANTENNA COUPLER GROUP AN/SRA-15

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O-32	(b)	BRACKET: bearing mount, worm shaft support; aluminum alloy, alodine finish; 1-1/8 in. wd, 1-1/2 in. high, 2-7/8 in. lg; four 3/16 in. diam mounting holes; two 1/8 in. diam centering holes; one bearing press fitted into 23/32 in. hole on each end; Fafnir Corp. #F-5; NEMS-CLARKE, Inc. part/dwg #B-12,850.	Bearing mount for worm-gear shaft O-27
O-33	(b)	COLLAR: brass, nickel plate; 9/16 in. OD, 0.312 in. ID with a #6-32 tapped, setscrew hole and a 0.078 in. diam taper pin hole 90° apart; NEMS-CLARKE, Inc. part/dwg #A-12,816.	Locks worm-gear shaft O-27 inside worm-shaft support bracket O-32
O-34	(g)	COUPLING: assembly consists of a phenolic sleeve 1 in. lg, 15/32 in. OD, 1/4 in. wd, 3/4 in. OD shoulder in center, 5/16 in. shaft hole; 1 in. lg taper pin and setscrew holes in each end; NEMS-CLARKE, Inc. part/dwg #A-12,668-1; and two collars; brass, nickel plated; one each end; 3/4 in. OD, 0.469 in. ID; #6-32 tapped, setscrew hole and 0.110 in. diam taper pin hole, half drilled at each end; NEMS-CLARKE, Inc. part/dwg #A-12,667 per NEMS-CLARKE, Inc. assembly part/dwg #AA-13,083-1.	Couples worm-gear shaft O-27 with TUNING drive shaft O-55
O-35	(g)	BEARING, SLEEVE: assembly consisting of dial drive shaft bearing; brass, nickel plated; 1/2 in. OD, 5/16 in. ID, 3/8 in. lg over-all, 9/16 in. hex flange one end; #1/2-20 thd, 1/4 in. d other end; NEMS-CLARKE, Inc. part/dwg #A-12,590-2; lock washer, 1/2 in. internal tooth; phosphor bronze, nickel plated; nut 3/4 in. hex, 1/8 in. thk; brass, nickel plated; NEMS-CLARKE, Inc. part/dwg #A-12,591.	Bearing for TUNING dial-drive shaft O-55
O-36		GEAR, BEVEL: straight type; brass; 32 teeth; 5/32 in. face; 1 in. pitch diam; tapped #6-32 thd setscrew hole, #36 taper pin hole, 90° apart; 5/16 in. diam bore; 11/32 in. backing; Chicago Gear Works part #B-119 modified; NEMS-CLARKE, Inc. part/dwg #A-13,088-1.	Matched bevel gear for counter-drive shaft O-56 of TUNING control
O-37		GEAR, BEVEL: straight type; brass; 16 teeth; 5/32 in. face; 1/2 in. pitch diam; tapped #6-32 thd setscrew hole, #36 taper pin hole, 90° apart; 3/8 in. diam bore; 7/32 in. backing; Chicago Gear Works part #B-119 modified; NEMS-CLARKE, Inc. part/dwg #A-13,088-2.	Matched bevel gear for counter-drive shaft O-56 of TUNING control
O-38		GEAR, BEVEL: straight type; brass; 18 teeth; 1/8 in. face; 3/8 pitch diam, two tapped #4-40 thd setscrew holes, 90° apart; 1/8 in. bore; 7/32 in. backing; Chicago Gear Works part #B-117 modified; NEMS-CLARKE, Inc. part/dwg #A-13,089-2.	Matched bevel gear for driving counter M2 of TUNING control
O-39		GEAR, BEVEL: straight type; brass; 36 teeth; 1/8 in. face; 3/4 in. pitch diam; 2 tapped #4-40 thd setscrew holes, 90° apart; 1/8 in. bore; 1/4 in. backing; Chicago Gear Works part #B-117 modified; NEMS-CLARKE, Inc. part/dwg #A-13,089-1.	Matched bevel gear for driving counter M2 of TUNING control
O-40		CLAMP, ELECTRICAL: dial locking assembly, consisting of a knob, spacer, pivot guide, pin, special washers, and associated hardware; NEMS-CLARKE Inc. part/dwg #AB-13,111.	Locking assembly for COUPLING dial O-14 and TUNING dial O-15
O-41	(b)	BLOCK, BEARING: brass, nickel plated; height 11/16 in., base 1-3/8 in. by 1 in., including 1/4 in. flange with 4 tapped mounting holes #43, 0.089 in. drill #4-40 thd, 1 inch c to c; bearing hole 0.187 in. diam, 0.406 in. from base, runs the length of the block; NEMS-CLARKE, Inc. part/dwg #A-12,729.	Bearing block for counter-drive shaft O-42
O-42	(b)	SHAFT: stainless steel; 5/16 in. OD, 2-11/16 in. lg; section 1-7/8 in. lg has 3/16 in. diam, section 11/16 lg has 1/8 in. diam; ring 3/16 in. lg has 5/16 diam; NEMS-CLARKE, Inc. part/dwg #A-12,730.	Counter-drive shaft for COUPLING circuit
O-43	(g)	CLAMP, ELECTRICAL: brass, silver plated; formed strip, 1-1/8 in. radius, with tabs mounted on a U shaped bracket 1/8 in. thk with hole in c; NEMS-CLARKE, Inc. part/dwg. #AB-15,178.	Clips for holding vacuum capacitor C3

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-421/SRA-15 ANTENNA COUPLER GROUP AN/SRA-15

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O-44	(g)	CLAMP: Holding; brass, silver plated; formed strip, 7/16 in. wd x 1/8 in. thk; NEMS-CLARKE, Inc. part/dwg #A-15,159-2.	Locks clips O-43
O-45	(g)	CLIP: retaining; phosphor bronze, nickel plated; 1-3/8 in. lg, 3/4 in. wd, 3/4 in. high; two 5/16 in. sq tabs for securing clip to chassis; NEMS-CLARKE, Inc., part/dwg #A-12,688.	Holds shorting bar assembly E3
O-46	(g)	CLIP: locking; phosphor bronze, nickel plate; 3/4 in. lg, 3/4 in. wd, 0.032 in. thk; NEMS-CLARKE, Inc. part/dwg #A-12,687.	Locks clip O-45
O-47	(g)	BUSHING: reducing fitting; brass, silver plated; 1-1/2 in. lg, 1-1/2 in. OD, 1-5/16 in. ID, 3/32 in. thk; tubing; NEMS-CLARKE, Inc. part/dwg #A-12,804.	Reducing fitting for thimble of vacuum capacitor C3
O-48	(b)	MOUNTING: block; silicone glass laminate; 3-1/2 in. lg, 3/4 in. wd, 3/4 in. high; two end mounting holes drill #4 (0.209) and center bore 3/8 in. diam by 1/4 d; two holes 1/2 in. from center, drill 3/16 in. (0.187) diam; one center hole drill 7/32 in. diam; NEMS-CLARKE, Inc. part/dwg #A-12,782.	Mounting block for vacuum capacitor C3
O-49	(b)	HOLDER, WRENCH: No. 3; full size, bronze; connector wire; Fahnstock Electric Co. nomenclature.	Mounts #4, #6, and #8, Allen wrenches
O-50	(d)	Not Applicable.	Holder for calibration chart
O-51	(b)	WINDOW: lucite, clear; 3-7/8" lg, 2-9/16"wd, 1/32" thk; purchased from Colonial Kalomite Co.; NEMS-CLARKE, Inc. part/dwg #A-12,616.	Cover for calibration chart
O-52	(g)	FASTENER, LATCH: safety catch assembly, consisting of an assembly stop, arm, bearing, stop, screw, spring posts and associated hardware; NEMS-CLARKE, Inc. part/dwg #AB-13,276.	Safety catch assembly for drawer chassis
O-53	(g)	BUSHING, PLAIN, FLANGED: shape style No. 2A, section A, 11, Ref Dwg Group 191; aluminum alloy; 1.126 in. OD, 0.7812 in. ID, 0.25 in. thk; NEMS-CLARKE, Inc. part/dwg #A-12,801.	Bushing for helical-gear drive shaft O-23
O-54	(g)	GUIDE, DRAWER: Stainless steel; one end flanged; flange flattened on two sides; 1-1/4 in. lg, 7/8 in. max OD flange, 3/4 in. wd on flat side of flange; external thd #5/8-24; center hole 0.313 in. diam with flange and chamf 1/16 x 30°; NEMS-CLARKE, Inc. part/dwg #A-12,584.	Receives drawer - chassis guide pin O-304
O-55	(b)	SHAFT: stainless steel, passivate finish; 5/16 in. OD, 2-7/8 in. lg; 7/16 in. lg keyway 1/32 in. d with a 1/32 in. rad; 1/32 x 45° chamf both ends; NEMS-CLARKE, Inc. part/dwg #A-12,799.	Drive shaft for TUNING control
O-56	(b)	SHAFT: stainless steel, passivate finish; 5/16 in. max OD, 2-1/2 in. lg; 5/16 in. diam collar, with one side chamf 1/64 x 30°, 1-5/16 in. from one end; shank 1-5/16 in. lg has 0.186 in. diam; other end has two sections: one section is 23/32 in. lg with 1.87 in. diam and is chamf on one end 1/64 x 30°; end section is 11/32 in. lg and 0.125 in. thk; both ends of shaft are chamf 1/64 x 45°; NEMS-CLARKE, Inc. part/dwg #A-13,410.	Counter-drive shaft for TUNING CONTROL
O-57		BLOCK, BEARING: for counter drive shaft; brass, nickel plated; height 11/16 in., base 1 in. x 7/8 in. including 1/4 in. flange each side of broad dimensions; two mounting holes in each flange, #43 (0.089) drill and tap #4-40, 1/2 in. c to c; bearing hole 0.187 in. diam 0.406 in. from base, runs length of the block; NEMS-CLARKE, Inc. part/dwg #A-13,413.	Bearing block for counter-drive shaft O-56
P1		CONNECTOR, PLUG: giant banana plug #398 Birnbach Radio Co.	Connects coupler to receptacle J301
P2		CONNECTOR, PLUG: UG-21B/U, per Navy dwg RE49F402.	Used on cable W301 to connect directional coupler DC1 to air-dielectric capacitor C4

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-421/SRA-15 ANTENNA COUPLER GROUP AN/SRA-15

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
R1		RESISTOR, FIXED, COMPOSITION: body style No. 14, Ref Dwg Group 2; 68,000 ohms total resistance; ±10% tolerance; 1/2 w; Allen-Bradley.	Used with sensitivity switch S1
R2		RESISTOR, FIXED, COMPOSITION: used in directional coupler; 130 ohms total resistance; ±5% tolerance; 2w; Allen-Bradley.	Limiting resistor
S1		SWITCH, TOGGLE: SPST; 2 positions; Arrow Hart and Hegeman; ST12A per JAN-S-23.	Sensitivity switch for meter S1
W1	(j)	CABLE, SPECIAL PURPOSE, ELECTRICAL: assembly consists of connector UG-21B/U; coaxial cable RG-8/U, 12-7/8 in. lg; ground strap soldered to one end and lug soldered to conductor at the same end, NEMS-CLARKE, Inc., part/dwg #AA-13,308-1.	Connects directional coupler DC1 to air-dielectric capacitor C4

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

FUSE PANEL SB-406/SRA ANTENNA COUPLER GROUP AN/SRA-15

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
		PANEL, FUSE SB-406/SRA: Contains four fuses, indicator lamp, connector and receptacle; 11-7/32 in. h x 24-3/4 in. wd x 10-3/8 in. d; cabinet mounted, on pull-out slides; NEMS-CLARKE, Inc. part/dwg #AF-13,776.	Mounts components for protecting blower assembly
E201		CLAMP, ELECTRICAL: cable clamp; AN3057-6 Amphenol.	Clamps power cable on P201
F201		FUSE, CARTRIDGE: Navy type 28032-3; 3 amp; blowing time, life at 110%, 1 hr at 135%, 5-6 sec at 200% load; 250 v; one time; glass body; ferrule term; 1-1/4 in. diam at each end; Littelfuse (LTF) type 3AG, part #1043.	A-C line
F202		Same as F201.	A-C line
XF201		FUSE HOLDER: in-the-line type; 250v, 3 amp; two holders are for one line fuse each; two holders are for one spare fuse each; coml. H.K.P. Bussman Mfg. Co.	Holder for line and spare fuses
I-201		LAMP, INCANDESCENT: double contact, bayonet type; replaceable from the front of the cabinet; 120v, 6w; 6S6 DC General Electric.	Signal lamp to indicate blower unit is operating
J201		CONNECTOR, RECEPTACLE: AN3102A-14S-7P Amphenol.	Power input receptacle
P201		CONNECTOR, PLUG: 90° angle plug; AN-3108B-14S-7S Amphenol.	Power input plug
XI-201	(g)	LAMPHOLDER: part of assembly LH63BG2 per MIL-L-3661, per Dial Light Corp. #51202-112; the lampholder carries the catalog #51202-1 Dial Light Corp.	Holder for lamp I-201 and lens XI-202
XI-202		LENS, INDICATOR LIGHT: includes lensholder; catalog #51-112 Dial Light Corp.	Lens for lamp I-201

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ELECTRICAL EQUIPMENT CABINET CY-1670/SRA ANTENNA COUPLER GROUP AN/SRA-15

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
		CABINET, ELECTRICAL EQUIPMENT CY-1670/SRA: Contains four antenna couplers, a fuse panel, blower assembly, vertical coaxial tube, and air ducts; 46-3/4 in. h x 26-1/4 in. wd x 20-1/2 in. d; NEMS-CLARKE, Inc. part/dwg #AC-13,050.	Contains major units and assemblies of Coupler Group Antenna AN/SRA-15
B301		MOTOR, ALTERNATING CURRENT: dual voltage; 115/230V ac; model DRCP, type KS-505-CCW, series 153 BS Rotron Mfg. Co.	Motor for blower unit
C301		CAPACITOR, FIXED, PAPER DIELECTRIC: 3 μf; 220V R.B.F #701 Aerovox.	Motor starting capacitor
E301	(g)	BLOCK, CONTACT: brass, silver-plate finish; 2 in. lg, 3/4 in. sq.; two mounting holes, drill #17 (0.173 diam); end hole for jack, drill #29/64 (0.453) and tap #1/2-20 x 7/8 d; center bore 17/32 x 1/16 in. d; NEMS-CLARKE, Inc. part/dwg #A-12,685.	Holder for J301 (8 per set)
E302		INSULATOR, RING: lava, grade "A", white; dimensions Ref. Dwg. Group 9, item code No. 90, D-5/8 in. F-0.561 in., H-0.25 in., L-3/8 in., E-3/16 in.; NEMS-CLARKE, Inc. part/dwg #A-13,524.	For bracing as well as insulating conductor rod in r-f transmission line W301 (5 per set)
E303		INSULATOR, RING: lava, grade "A", white; dimensions 0.561 in. OD, 0.250 in. ID, 3/8 in. thk, shoulder; per NEMS-CLARKE, Inc. part/dwg #A-12,525.	For bracing as well as insulating one end of conductor rod of r-f transmission line W301 (1 per set)
E304	(d)	Not Applicable.	Contact strip
E305	(d)	Not Applicable.	Contact strip
E306	(d)	Not Applicable.	Contact strip
E307	(d)	Not Applicable.	Contact strip
E308	(d)	Not Applicable.	Contact strip
E309	(d)	Not Applicable.	Contact strip
E310	(d)	Not Applicable.	Contact strip
FL301		FILTER, AIR CONDITIONING: fiberglass; 10 in. by 10 in. by 1 in.; Owens Corning Corp.	Filter for blower unit (2 per set)
J301		CONNECTOR, RECEPTACLE: giant jack; #399 Birnbach Radio Co.	Receptacle for banana plug J1 (8 per set)
J302		CONNECTOR, RECEPTACLE: UG-352A/U; per Navy dwg RE49F509.	Output jack (to antenna)
O-301	(d)	Not Applicable.	Lifting ring (4 per set)
O-302	(b)	MOUNTING: block; silicone glass laminated; 2-1/4 in. lg, 2 in. wd, 7/8 in. thk; 4 mounting holes, drill #7 (0.201) and tap #1/4-20 through, center bore 0.328 in. diam x 7/64 (0.109) in. d; four rosan inserts (cat. #R104SB-6) in. mounting holes and two rosan inserts (cat. #R106SB-8) in holes for jack holder, these two holes are 5/16 in. (0.312) diam drill and tap #3/8-16 through center bore 0.437 in. diam x 5/32 in. (0.156) d; NEMS-CLARKE, Inc. part/dwg #B-12,689.	Mounts contact blocks E301 (4 per set)
O-303	(b)	MOUNTING: block; stainless steel; 1/2 in. diam, 5/16 in. thk; center hole drill "F" (0.257) diam and tap #5/16-18 thd; three mounting holes 120° apart on 19/32 in. rad drill #36 (0.106) diam and tap #6-32 thd; NEMS-CLARKE, Inc. part/dwg #A-12,581-2.	Mounts guide pin O-304 (4 per set)

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ELECTRICAL EQUIPMENT CABINET CY-1670/SRA ANTENNA COUPLER GROUP AN/SRA-15

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O-304	(b)	PIN, STRAIGHT, HEADED: stainless steel, passivate finish; 1-15/16 in. over-all length; shank end 1-1/2 in. lg. 0.312 in. diam, end pointed 1/32 in. rad 30°; square collar 5/16 in. from other end 1/8 in. thk, 3/4 in. on a side, corners rounded on a 7/16 in. rad; end section 5/16 in. lg, threaded 5/16-18; NEMS-CLARKE, Inc. part/dwg #A-13,516.	Aligns drawer chassis in cabinet (4 per set)
TB301		STRIP, TERMINAL: general-purpose terminal strip; 4 double screw type terminals; bakelite; 3-1/4 in. lg x 1-9/32 in. wd x 5/8 in. thk; Howard B. Jones Division of Cinch Man. Corp. part #4-142.	Connections for input power
W301	(g)	LINE, RADIO FREQUENCY TRANSMISSION: coaxial type; 50 ohms characteristic impedance; line has three inner line conductors, brass, silver plated, 0.250 in. diam, 6-9/16 in. lg; outer conductor, 5/8 in. OD, 9/16 in. ID, brass telescopic tubing, silver plated; NEMS-CLARKE, Inc. part/dwg #AB-12,550.	R-F transmission line to output jack J302

TABLE 8-2. STOCK NUMBER IDENTIFICATION

REFERENCE DESIG.	NOTES	STOCK NUMBERS			
		FEDERAL	STANDARD NAVY	SIGNAL CORPS	USAF
B301			N17-M-57708-2242		
C1	(k)		N16-C-33617-4751		
C1	(n)		N16-C-65878-6722		
C2	(k)		N16-C-29657-7644		
C2	(n)		N16-C-33617-4751		
C3			N16-C-59993-9001		
C3	(k)		N16-C-65863-9275		
C301			N16-C-49601-9619		
C4	(m)		N16-C-60500-2338		
C4	(l)		N16-C-61007-6076		
CR1			N16-T-51734-10		
E1	(k)		N17-I-69216-9551		
E1			N17-I-70386-6221		
E3			N17-J-73841-8195		
E4			N17-P-62674-3071		
E201			N17-C-781366-251		
E-302			N17-I-49275-6756		
E303			N17-I-49143-5953		
F201			G5920-010-6652		
FL301			N66-F-390-749		
H1			N16-S-118401-254		
I-201			G6240-143-3060		
J201			N17-C-72604-1522		
J301			N17-C-73108-3690		
J302			N17-C-73115-8789		
L1			N16-C-71752-3563		
L1	(l)		N16-C-71581-3269		
L1	(m)		N16-C-71581-4370		
L2	(k)		N16-C-71581-2718		
L2			N16-C-71581-2993		
M1			N17-M-18910-7557		

TABLE 8-2. STOCK NUMBER IDENTIFICATION (Cont)

REFERENCE DESIG.	NOTES	STOCK NUMBERS			
		FEDERAL	STANDARD NAVY	SIGNAL CORPS	USAF
M2			N18-R-276-189		
O-1			N16-G-600701-221		
O-3			N16-G-505001-255		
O-4			N16-G-505001-260		
O-11			N42-C-22386-1195		
O-16			N16-G-404051-823		
O-17			N16-G-404051-824		
O-18			N17-C-98436-8803		
O-20			N16-G-414685-457		
O-21			G3110-155-8416		
O-27	(k)		N16-G-505001-258		
O-27			N16-G-505001-259		
O-28	(m)		N16-G-505001-257		
O-28	(l)		N16-G-505001-256		
O-28			N16-G-505001-261		
O-29			N16-G-505001-262		
O-36			N16-G-404051-821		
O-37			N16-G-404051-822		
O-38			N16-G-404051-820		
O-39			N16-G-404051-819		
O-40			N17-C-789978-719		
P1	(k)		N17-C-78543-5546		
P1			N17-C-78543-5548		
P2			N17-C-71416-2550		
R1			N16-R-50182-438		
R1	(k)		N16-R-50552-818		
R2	(l)		N16-R-49607-116		
R2			N16-R-49597-438		
R2	(m)		N16-R-49588-996		
S1			N17-S-70777-8626		
TB301			N17-B-77639-1548		
XF201			N17-F-74267-5075		
XI-202			N17-L-250389-501		
LIST OF NOMENCLATURED ITEMS					
AN/SRA-13 w/o SPARES			F16-Q116911-0100		
AN/SRA-13 w/SPARES			F16-Q116911-0200		
AN/SRA-14 w/o SPARES			F16-Q116914-0100		
AN/SRA-14 w/SPARES			F16-Q116914-0200		
AN/SRA-15 w/o SPARES			F16-Q116917-0100		
AN/SRA-15 w/SPARES			F16-Q116917-0200		
AN/SRA-16 w/o SPARES			F16-Q116919-0100		
AN/SRA-16 w/ SPARES			F16-Q116919-0200		

TABLE 8-3. LIST OF MANUFACTURERS

ABBREVIATION	PREFIX	NAME	ADDRESS
Aerovox	CAW	Aerovox Corp.	742 Belleville Ave New Bedford, Mass.
AB	CBC	Allen-Bradley Co.	118 W. Greenfield Ave. Milwaukee, Wis.
Amphenol	CPH	American Phenolic Corp.	1830 South Fifty-Fourth Ave. Chicago, Ill.
	CHH	Arrow, Hart and Hegeman Electric Co.	102 Hawthorne St. Hartford, Conn.
Birnback	CYB	Birnback Radio Co., Inc.	145 Hudson St. New York, N.Y.
	CBH	Boston Gear Works	10 Hayward St. W. Quincy, Mass.
Buss	CFA	Bussman Mfg. Co.	2538 W. University St. St. Louis, Mo.
		Cardwell Mfg. Co., Inc.	Wichita, Kans.
		Chicago Gear Works	Chicago, Ill.
		Colonial Kalomite Co.	
	CD	Cornell-Dubilier Corp.	1000 Hamilton Blvd. South Plainfield, N.J.
	CBI	Corning Glass Works (Owens-Corning Fiberglass Corp.)	1943 Crystal St. Corning, N.Y.
Dialia	CAYC	Dial Light Corp.	900 Broadway New York, N.Y.
Fafnir		Fafnir Bearing Co., The	New Britain, Conn.
		Fahnestock Electric Co., Inc.	Long Island, N.Y.
		Fish Brothers Refining Co.	Newark, N.J.
GE	CG	General Electric Co.	1 River Road Schenectady 5, N.Y.
	CGM	General Motors Co. New Departure Div.	Detroit, Mich.
	CBU	Isolantite, Inc.	343 Countland St. Belleville, N.J.
	CAEG	Jennings Radio Mfg. Co.	1098 E. Williams St. San Jose 2, Calif.
	CN	Nems-Clarke, Inc.	919 Jessup Blair Drive Silver Spring, Md.
		Parker-Kalon Corp.	New York 14, N.Y.
		Rotron Mfg. Co.	Schoenmaker Lane Woodstock, N.Y.
	CAN	Sangamo Electric Co.	1935 Funk St. Springfield, Ill.
	CHS	Sylvania Electric Products, Inc.	Emporium, Pa.
	CASV	Veeder-Root, Inc.	25 Sargent St. Hartford, Conn.
W.E. Co.	CV	Weston Electric Instrument Co.	619 Frelinghuysen Ave. Newark, N.J.
		Williams Co., The	London, Ohio

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